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M. J. Dorsey

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Vol. 13 NOVEMBER, 1924 No. 11

ENTRIES 7499-8113

AGRONOMY

C. V. PIPER, *Editor*

MARY R. BURR, *Assistant Editor*

(See also in this issue Entries 7531, 7532, 7569, 7587, 7673, 7679, 7735, 7742, 7753, 7788, 7891, 7930, 7931, 7933, 7937, 8026)

7499. ANONYMOUS. **Beet sugar in England.** Australian Sugar Jour. **16**: 60. 1924.—A visit of a correspondent to the beetsugar factory at Cantley, England, is described, and the reported results obtained by the factory last year are given. The arrangement between the growers and the factory and economic effects of the enterprise are mentioned. English economists believe "there is room for at least a hundred Cantleys in suitable areas in England, and urge that it is possible for Great Britain to grow the greater part of its sugar requirements and incidentally add largely to the supply of cattle food, and above all to increase rural employment."—*Nellie E. Pealy.*

7500. ANONYMOUS. **Cane seedling work in Hawaii.** Australian Sugar Jour. **16**: 163-164. 1924.—Two methods of pollinating the flowers of Uba cane were quite successful at the Experiment Station of the Hawaii Sugar Planters' Association. One of these methods was to fasten a freshly cut tassel of D.1135, Badila, or H.109 on the Uba tassel inside a cloth bag; the other was to hand-pollinate each feathery stigma. The stigmas of the female flower are susceptible to impregnation for only a few hours and the pollen is viable for only a short time. The present seedling work in Hawaii is supposed to have started with that of Eckart about 1904. The 1st year he raised about 280 seedlings; from this beginning H.109 was developed, having been selected from 5000 seedlings, while in Barbados only 4 selections are in general use from over a million seedlings raised there. Especially in the Kohala District of Hawaii Yellow Caledonia is decreasing in vigor, and Striped Tip and Yellow Tip, the standard Mauka canes, are extremely sensitive to mosaic and very susceptible to a leaf disease peculiar to these varieties and to that district.—*Nellie E. Fealy.*

7501. ANONYMOUS. **Combining agriculture and anti-malaria drainage.** Trans. Fourth Conf. Malaria Field Workers, Chattanooga, Tennessee. Public Health Bull. 137. *165-171.* 1922.—Combining agricultural and anti-malaria drainage offers many advantages. In portions of the South tiling to lower the water level for crop growing eliminates many breeding places of *Anopheles*. Often anti-malaria ditching lowers the water table so as to per-

mit agricultural activities. It is very frequently necessary to stress both classes of benefits to have either type of drainage done.—*G. H. Hazlehurst.*

7502. Anonymous. **Cultivation on unirrigation plantations in Hawaii.** Australian Sugar Jour. **16**: 162–163. 1924.—According to the report of the Hawaiian Sugar Planters' Association Committee on Cultivation and Fertilization on Unirrigated Plantations, the major portion of the plowing, harrowing, and furrowing is done with tractors. Thorough plowing, harrowing, and subsoiling before planting has considerable effect on weed control and cultivation generally, and a 2nd plowing about a month after the 1st generally gives good results. It would seem that selection from 2nd or 3rd ratoons might produce strains with good ratooning qualities. Some of the progenies from plant fields gave good stools as plant cane, but fell below the average as ratoons. In selecting seed cane, care should be taken to look for vigorous material, and well-developed eyes are absolutely necessary.—*Nellie E. Fealy.*

7503. Anonymous. **Deterioration of green and burnt cane.** Australian Sugar Jour. **16**: 94–95. 1924.—Experiments mentioned by H. T. Easterby, Director of the Bureau of Sugar Experiment Stations, showed that green cane may deteriorate as well as burnt cane. Nothing was found to show that cane should be burnt, but indications were that, even in the case of green cane, it is important to have the cane passed through the rollers as soon after cutting as possible.—*Nellie E. Fealy.*

7504. Anonymous. **Electrification of Cuban sugar mills.** Australian Sugar Jour. **16**: 105–112. 1924.—The article gives a concise history of the electrification of Cuban sugar mills; American, Cuban, and European percentage ownership of these mills; advance made under electrification; and effect of the example set in Cuba on other sugar-producing countries.—*Nellie E. Fealy.*

7505. Anonymous. **Electro-culture work in 1922 and 1923.** Jour. Ministry Agric. Great Britain **30**: 321–326. 1923.—An account of the experimental work on electro-culture, carried out in 1922 and projected for 1923, is summarised from the Fifth Interim Report of the Ministry's Electro-culture Committee. Previous work of this Committee was summarised in this Journal, p. 792, December, 1922.—*W. J. Morse.*

7506. Anonymous. **Machinery section. Bingera improvements.** Australian Sugar Jour. **16**: 193–195. 1924.—Descriptions are given of improved machinery for sugar mills, including an unstrained juice pump, a masceration distributor, Peck Mill raw juice strainers, and the Kopke device for clarification.—*Nellie E. Fealy.*

7507. Anonymous. **Manuring and cultivation. Cane trash for fertilizer purposes.** Australian Sugar Jour. **16**: 46–48. *2 fig.* 1924.—The Adco Process of preparing materials for use as fertilizer is being successfully used by a number of farmers. The process consists in placing waste materials under the best conditions for rapid rotting; this includes the use of chemical stimulants for bacterial growth, which are applied most advantageously by pumping them over the material. It is claimed that the cost of labor for converting straw into fertilizer by this process is much less than the cost of converting the straw into manure by feeding it to stock. Moreover, not more than 50% of the fertilizer value in feeding stuffs consumed by animals reaches the soil, while with the artificial process the material retains practically all its N and useful organic matter, and in the form in which it is applied to the soil is most readily available as plant food. Trash from sugar cane makes a good manure. Compared with Adco from straw the preparation from cane trash was found superior in N and K content, and while somewhat inferior in phosphate it contained a substantially higher percentage of organic matter.—*Nellie E. Fealy.*

7508. Anonymous. **Petrol driven rotary cultivator.** Australian Sugar Jour. **16**: 58–59. *3 fig.* 1924.—A rotary cultivator which may be of material service in the cultivation of sugar cane is described and a brief statement made in regard to its development. It is claimed that this machine, which is known as the Simar Rototiller 10, will be found capable of adoption throughout the British Empire.—*Nellie E. Fealy.*

7509. Anonymous. **Plane Creek Central Mill.** Australian Sugar Jour. **16**: 124–126. 1924.—At the annual meeting of the Plane Creek Central Mill Co. it was stated that deterioration was much greater in cane burned during the heat of the day than when burned at

night, and the burning of cane was discouraged as bad for all concerned. Comparison of sugar from Uba cane with samples from the worst cane of other varieties handled by the mill showed the Uba sugar to be very dark brown while the others were only slightly tinged with color. Clark Seedling was reported as giving 12.5 C.C.S. and Malabar 14 C.C.S.—*Nellie E. Fealy.*

7510. ANONYMOUS. **Russian sugar progress.** Australian Sugar Jour. 16: 153–155. 1924. —The sugar industry as conducted by the Sugar Trust is discussed, together with results obtained and the ambitions of the Trust regarding extension of sugar markets.—*Nellie E. Fealy.*

7511. ANONYMOUS. **Sugar experimental work in Java.** Australian Sugar Jour. 16: 105, 1924.—Among the lines of work to be carried on by the Java Exp. Sta., are analyses of commercial fertilizers, fertilizer experiments in cane fields, investigation of certain cane plants and their enemies, bi-monthly meteorological reports, irrigation problems, improvement of intrinsic saccharine powers of cane, and obtaining of analytic and comparative facts and figures and reducing them to standards for future guidance. In the chemical work special emphasis will be placed on unexplored fields in the sugar industry.—*Nellie E. Fealy.*

7512. ANONYMOUS. **The Searby shredder in Hawaii.** Australian Sugar Jour. 16: 115, 1924.—According to a report of the Committee of the Hawaiian Sugar Planters' Association dealing with machinery, Oahu reports an increase of over 1% in extraction as a result of having both mill trains equipped with Searby shredders, and Onomea reports a higher grinding rate at lower mill speed due to a uniform layer of bagasse coming from the shredder preparation. There are 16 of these shredders in Hawaii, 12 of which have given satisfactory results. The 4 which have not given as satisfactory results as the others are located ahead of the crusher, taking the cane direct from the carrier, instead of being placed between the crusher and first mill.—*Nellie E. Fealy.*

7513. ANONYMOUS. **Tractors in Hawaiian cane cultivation.** Australian Sugar Jour. 16: 132. 1924.—Brief notes are given on the introduction and use of agricultural machinery in Hawaii, including the Fowler Steam Plow Tackle, the tractor, and the "Killefer" subsoiler, and on the necessity of close supervision of plantation tractors with suggestions for keeping records of work done with them.—*Nellie E. Fealy.*

7514. ARTHUR, B. M., AND R. N. MAKIN. **Farmers' experiment plots. Wheat and oat experiments, 1923.** Agric. Gaz. New South Wales 35: 319–325. 1924.—Crops were grown cooperatively by 8 farmers. Results in the western district were adverse due to seasonal conditions. In the southern tableland district certain varieties of oats secured by selection and breeding from Sunrise and Algerian seem destined to replace these 2 varieties.—*L. R. Waldron.*

7515. BLAKELY, W. F. **Prolific weeds.** Agric. Gaz. New South Wales 35: 346–348. 1924.—The following weeds, *Tribulus terrestris* (caltrops), *Heliotropium europoeum* (wild heliotrope), *Navarretia squarrosa* (Californian stink weed), *Solanum rostratum* (buffalo burr), *Centaurea solstitialis* (St. Barnaby's thistle), *Inula graveolens* (stinkwort), and *Tagetes minuta* (stinking noger) are discussed. These weeds are either comparatively new to New South Wales or have not hitherto acted aggressively.—*L. R. Waldron.*

7516. BRUCE. **Sugar notes in Federal circles.** Australian Sugar Jour. 16: 23–25, 28. 1924.—Reference is made to "The announcement that the Commonwealth is going to put molasses to a practical use in the manufacture of power alcohol," that it may yet become the driving force in the sugar factories of Australia, and that it is capable of being used as fuel. An output of 50,000 tons of molasses at 65 gallons of alcohol per ton would yield 3,250,000 gallons. "How far this would go in taking the place of megass [bagasse] as a fuel is an open question, but it seems certain that megass has a greater future before it than merely to be burned as a refuse of cane. "The fact that megass can be profitably turned into building boards, which for many purposes are more suitable than the ordinary timber of commerce, seems definitely proved. . . . . It is claimed for the sugar industry that the new departure will add millions to the income of the planters." Louisiana is estimated to be capable of supplying enough megass to make 6,000,000 feet of fiber board per day. According to a statement of one of the vice presidents of the Louisiana Company, appearing in the

Planter, "Fibre board is being shipped to England, France, Belgium, South Africa, Canada, and Chile. It is being used in Japan for toy making, furnishes insulation for oil tanks, sheathing for buildings, packing for the Smithsonian Institute, for automobile tops to deaden the sound of the engine, in refrigerating cars, under linoleum to deaden sound, and impregnated with oil as a substitute for cork flooring." The business was established by newspaper men from the North.—*Nellie E. Fealey.*

7517. Graham, Vere and R. H. Carr. **Chemical factors determining the quality of tobacco.** Jour. Amer. Chem. Soc. **46**: 695–702. 1924.—Samples of White Burley tobacco leaf grown in 2 different localities in Indiana and on a series of plots receiving different lime and fertilizer treatments were subjected to successive extraction with petroleum ether, ethyl ether, ethyl alcohol, and boiling water. Similar studies also were made with Burley and other types of tobacco leaf grown in Wisconsin, Connecticut, and Kentucky, and with certain brands of manufactured smoking tobaccos and cigars. A relation was found between the different grades of tobacco and their comparative solubilities in the solvents used. Cigar tobacco of good quality contains a low percentage of extractives, while smoking tobacco has a high solubility in the organic solvents employed. In plants having a high Ca content the nicotine is quite insoluble in petroleum ether and ethyl ether. Extraction with petroleum ether improves tobacco by removing vegetable waxes, volatile oils and loosely combined nicotine. Of the samples examined, the tobacco commanding the best price was grown in relatively poor sandy or clay soil unsuited to corn, and contained a low percentage of extractives, proteins and nicotine.—*W. W. Garner.*

7518. Henke, Louis A. **Fourth annual report of the Department of Agriculture.** Univ. Hawaii Quart. Bull. 1^1: 1–19. 1922.—Data on yield and cost of production of alfalfa in field tests for the years 1916–1921 are given. In variety tests with corn a Cuban-Guam hybrid gave good results. Several other varieties from various sources were not adapted to growth in Hawaii. Notes on field tests of miscellaneous crops are given.—*H. F. Bergman.*

7519. Henke, Louis A. **Fifth annual report of the Department of Agriculture.** Univ. Hawaii Quart. Bull. 2^1: 1–23. 1923.—Data are given on yield in field tests of alfalfa, sorghum and a mixture of alfalfa and Sudan grass, and of several varieties of corn. A Cuban-Guam hybrid and a new Guam-Cuban hybrid gave good results; most of the other varieties failed. Notes on yield of cassava, Panicum grass and Hubam clover and some chemical analyses of University Farm soils are given.—*H. F. Bergman.*

7520. Henke, Louis A. **Sixth annual report of the Department of Agriculture.** Univ. Hawaii Quart. Bull. 3^1: 6–17. 1924.—The results of field tests of alfalfa, corn, cowpeas, and sugar cane are indicated. Physical tests of soils from various plots and a mechanical analysis of an adobe soil from the University Farm are given.—*H. F. Bergman.*

7521. Heuvel A. ten. **Weersinvloeden bij zomerbemesting van Grasland.** [**Influences of weather during summer manuring upon grassland.**] Landbouwk. Tijdschr. **1**: 146–148. 1924.—In sandy sections of the northern part of the Netherlands it frequently happens that meadows are for a certain period grazed by cattle, after which barnyard manure is applied. Under favorable conditions grass may be cut after 6 to 8 weeks. In connection with this the desirability of time of manuring in relation to weather conditions is discussed. The occurrence of certain species of pasture plants which under some conditions may become dominant are mentioned, and experimental investigations in this direction are advised in order to obtain more exact data.—*J. C. Th. Uphof.*

7522. Jones, Inigo. **Precautions against frost.** Australian Sugar Jour. **16**: 149. 1924.—The writer claims that large losses in cane fields could be prevented by preparing heaps of straw in the fields and lighting them on cold nights. Smoke moderates the rays of the sun striking the frosted cane.—*Nellie E. Fealy.*

7523. Krauss, F. G. **Fifth annual report of the Department of Agriculture.** Univ. Hawaii Quart. Bull. 2^2: 41–50. 1923.—Physical and chemical analyses of plots used by the Division of Agronomy are given. The report consists mainly of a comparison of the cost of seed with forage production per acre of pigeon peas (*Cajanus indicus*). Preliminary fertilization and cultural experiments with pigeon peas, elephant or Napier grass (*Pennisetum purpureum*), Merker grass (*Pennisetum merkeri*) and of Uba or Japanese cane (*Saccharum offi-*

cinarum var.) indicate that the pigeon pea is the more desirable and by far the more economically produced crop under the conditions of the tests.—*H. F. Bergman.*

7524. Krauss, F. G. **Sixth annual report of the Department of Agriculture.** Univ. Hawaii Quart. Bull. 3²: 33–41. 1924.—The initiation of a project "to determine the most effective and economical methods and practices for improving and maintaining the fertility of the soil" is described. The crops used are sugar cane, pineapples, maize, pigeon peas, and soybeans. In tomato culture the use of a paper mulch has proved very effective in controlling the growth of nut grass (*Cyperus rotundus*) and also in increasing the size and quantity of tomatoes produced.—*H. F. Bergman.*

7525. Kyas, Otto. **Zur Methodik der Felddüngungsversuche. [Experimental methods in field fertilization.]** In: **Über Naturprodukte. Festschrift zum 70. Geburtstage für Max Hönig.** Edited by W. Fuchs und B. M. Margosches, Brünn. *P. 154–161.* Th. Steinkopff: Dresden, [no date].—The methods of field experimentation adopted by the Association of Czechoslovakian Experiment Stations are briefly discussed. Rectangular plots (7.2 m. × 25 m. = 180 sq. m.) are laid out in triplicates or quadruplicates. Before harvesting, the plants are removed from narrow strips (of 90 cm. width) lengthwise at the edges of the plots, eliminating marginal growth and disturbing influences of neighbored plots. Then areas of 4.55 m. × 6.30 m. = 29 sq. m. size are harvested at both ends of the plots, leaving in each case an area of 15.90 m. × 6.30 m. = 100 sq. m. for final determinations. If this inner plot becomes damaged compensation is made by calculations based upon the results obtained on the smaller end plots. The reliability of the crop data is ascertained by determining their probable error. In general, the results secured with this method in the course of 4 years have been very satisfactory.—*F. Löhnis.*

7526. Malden, W. J. **Grassland farming, pastures and leys.** *314 p. 113 fig.* Ernest Benn Ltd.: London, 1924.—This work discusses in some detail the first principles of pasture making, points regarding surface management, temporary pastures or leys, seeding temporary pastures, plants of permanent pastures, seed mixtures and seeding conditions, after-management of the newly sown crop, management of permanent pastures, old pastures, haymaking, ensilage, harvesting seed of pasture plants, grazing of pastures, manuring of permanent pastures, and breaking of pastures. An appendix gives a list of useful grass and other plant seed mixtures by several authorities and contains illustrations of plants of pastures and leys and of their seed, with technical descriptions and analyses of plants, also illustrations of weed seed common among pasture seed, together with a brief description of each.—*Mary R. Burr.*

7527. Mitscherlich, Eilh. Alfred. **Das Wirkungsgesetz der Wachstumsfaktoren und das Wachstumsgesetz der Plantzen. [The law governing the effect of growth factors and the law of growth of plants.]** Mitteil. Deutsch. Landw. Ges. **39**: 214–216. *Illus.* 1924—This article is a rejoinder to a paper by O. Nolte, in Mitteil. Deutsch. Landw. Ges. 38: 449–453, 1923, entitled "Beitrage zur Klarüng neuer Düngungsfragen." (See Bot. Absts. 13, Entry 683.) The author is of the opinion that the article in question does not contribute materially to such clarification.—Mitscherlich first calls attention to the distinction between the law governing the effect of growth factors and the law of growth. The 1st of these laws tells us how the yield of the plant increases with increase in one or another growth factor: the other tells how the yield varies with time. Concerning the 1st of these laws he points out that the effect of increasing a growth factor, such as a plant food element, can be determined only when all other factors influencing growth are kept constant. When this condition is observed, it is found that increase in yield with increasing application of fertilizer follows a definite law, which he designates as the "effect law (Wirkungsgesetz) of the growth factors," according to which the rate of increase in yield as fertilizer application increases is proportional to the yield increase yet possible by use of the fertilizer in question. Thus, if we let 100 represent the maximum yield increase obtainable, and if the first application produces an increase of 50, the increase yet possible is 50, and another similar application (added to the 1st) will produce a further increase of 25, so that the increase now lacks 25 of the maximum. Addition of a 3rd like quantity will raise the yield 12.5 points, or again half way to the maximum. Since the maximum obtainable yield is itself influenced

by the other factors, which are assumed to be constant in the above experiment, and since each yield is influenced by the magnitude of this maximum it follows that the actual yield obtained in any case is influenced by every growth factor. This law applies very well indeed to the observations of P. Wagner cited by Nolte, but not so well to the Rothamsted results because of the large experimental error in field experiments. Mitscherlich gives a comparison between experimental results and those calculated by means of his formula for 4 of P. Wagner's experiments, and for 10 experiments at the Rothamsted Experiment Station. The formula is—Log $(A - y) = \log A - c(x + b)$ in which A is the maximum yield, y the yield with x units of fertilizer, c the efficiency coefficient (Wirkungswert) of the fertilizer, and b is the quantity of plant nutrients already in the soil. The value of the constants in this formula is given for each of the 14 comparisons. He objects to Nolte's reference to this type of curve as an "ideal" curve, and insists that it is merely a question of the curve that best fits the data. This type of curve approaches continually toward a maximum, and hence bends toward the right throughout its course, and has no point of inflection.—It is pointed out that the graph of Liebig's Law of the Minimum is a straight line, and that such a line does not fit the experimental data. Nolte makes the error of assuming a bending point in the straight line. If he would demonstrate that the law must break down at some point, he must do this at least by demonstrating that the graph at that point becomes parallel to the x axis, which means that at best the law has only limited applicability. It is self evident that for some distance from the origin a straight line may be made to fit the experimental data fairly well, (for this portion of the curve for a short distance bends very little). It is contended that there is no other form for the graph of the effect law of growth factors (i.e., no other than that given by the Mitscherlich formula). But when we vary more than one growth factor at the same time, we get an s-curve. (See Landw. Jahrb. 53: 169. 1919.) When the s-curve does appear in experiments in which a single factor is made to vary, it signifies merely that other factors also have varied, perhaps without the knowledge of the experimenter.—Since during growth all factors of growth change with time, the 2nd physiological law of plants necessarily comes into play, namely, the "Law of Plant Growth" which governs the relation between growth and time. Mitscherlich does not deal further with this 2nd law, but promises in the near future a series of articles which in part will give the mathematical treatment of the law, and in part deal with its importance in plant culture, forestry, and animal husbandry.—*W. J. Spillman.*

7528. Squire, M. J. E. **Treatment of cotton seed with various pastes.** Agric. Gaz, New South Wales 35: 318. 1924.—Cotton seed were treated with agricultural lime, $CaSO_4$ and superphosphate pastes and with H_2SO_4. Treatment with H_2SO_4 which burned off the fuzz, allowing the seed to feed through the drill more satisfactorily, gave the best results. Seed treated with superphosphate paste had a germination of but 62%.—*L. R. Waldron.*

7529. Tempany, H. A., and F. Giraud. **Molasses as fertilizer for cane soils.** Australian Sugar Jour. 16: 87–90. 1924.—Molasses was used as a fertilizer in Mauritius several years prior to 1860, but its use for this purpose did not become extended until about 1900. It is now recognized as a part of the planting practice there, and the benefits resulting from its use are almost unanimously recognized by farmers. It is generally applied to fields bearing or about to bear virgin canes, but it is also customary to apply it to ratoon canes. The usual application is about 4 tons per acre, although sometimes as high as 15 tons are used. It is believed that on a cycle of 1 crop of virgin canes and 5 succeeding crops of ratoons the aggregate gain in yield from the use of molasses is as much as 20 tons per acre. It is believed that a considerable portion of the beneficial effects from its application is due to the exercise of the partial sterilization effect, leading to enhanced nitrification and accumulation of nitrates in the soil at a time when it is of the greatest benefit to the developing cane plant. In the case of increased yield in subsequent crops of ratoons it is believed that the effect may be attributed in part to the increased vigor imparted to the stools, and it must not be overlooked that addition of the organic matter and plant foot in molasses must tend to a permanent enrichment. Due account must be taken of the direct action of the manurial elements of this product, and it has been pointed out that it exerts a perceptible influence on the physical texture of soils, improving their condition and making them easier to work. —*Nellie E. Fealey.*

BIBLIOGRAPHY, BIOGRAPHY, AND HISTORY

Carroll W. Dodge, *Editor*
Charles A. Weatherby, *Assistant Editor*

(See also in this issue Entries 7582, 7583, 7671)

7530. Butters, F. K. **Edward W. D. Holway.** Bot. Gaz. 77: 115–116. *Portrait.* 1924. —A brief biography of Mr. Holway, the mycologist-banker, is presented.—*B. W. Wells.*

7531. Ernle, Lord. **Wisdom and folly of ancient book farmers.** Jour. Ministry Agric. Great Britain 29: 203–216. 1922.

7532. Heuvel, A. ten. **Een landbouwschrijver uit 1766 over Engelsch raaigras. [An agricultural writer of 1766 on English raygrass.]** Landbouwk. Tijdschr. 1: 114–115. 1924.—A citation is given of a Dutch translation of John Ray's (1627–1705) Historia plantarum, in which it is stated that raygrass growing wild in England has gained a high pitch of perfection through cultivation. In his time raygrass was grown with clover.—*J. C. Th. Uphof.*

7533. Pollacci, Gino. **In ricordo di Giovanni Briosi. [In memory of Giovanni Briosi.]** Atti Ist. Bot. Univ. Pavia Ser. II, 17: iii–xvii. *Portrait.* 1920.—Engineer, chemist, physiologist, histologist, mycologist, Giovanni Briosi died in Pavia, July 20, 1919. He founded the Agric. Exp. Sta. of Palermo, directed the Chem. Agric. Exp. Sta. of Rome for 6 years and in 1883 was appointed to the Chair of Botany at the Univ. of Pavia, directing also the Cryptogamic Laboratory. His influence has been profound. An appended list of his publications includes 161 titles. He worked on a great variety of subjects, the most important of which are: "I funghi parassiti delle piante coltivate od utili" in collaboration with C. Cavara, and a Botanical Atlas in collaboration with R. Farneti. He also studied the mineral substances in leaves of evergreens and the anatomy of leaves of *Eucalyptus globulus.*—*P. D. Caldis.*

7534. Sandback, Herm. A. **Auf Jacht nach Orchideen. [Hunting for orchids.]** Gartenwelt 27: 166–167, 174–176, 183. 1923.—Various travel memoirs in the republic of Colombia with regard to gathering and trading of Orchids, especially *Cattleyas* and *Odontoglossum crispum,* are mentioned.—*J. C. Th. Uphof.*

7535. Sherff, E. E. **Charles Frederick Millspaugh.** Bot. Gaz. 77: 228–230. *Portrait.* 1924.—A brief biography of Dr. Millspaugh, late Curator of Botany at the Field Museum of Natural History, Chicago, Ill., and a summary of his work in the fields of medical, economic, and taxonomic botany are given.—*B. W. Wells.*

7536. Wall, A. **Note on the origin and state of the herbarium.** Rec. Canterbury Mus. [New Zealand] 2: 91–92. 1922.—This note records the inception of the herbarium under Sir Julius von Haast in 1862, and the additions made by Kirk, Cheeseman, Cockayne and other contributors.—*H. H. Allan.*

7537. Ward, F. Kingdon. **The romance of plant hunting.** *xi + 275 p., 8 pl., 1 map.* E. Arnold & Co.: London, 1924.—Following a brief narrative of the author's journeys in Yunnan and Szechwan, the author describes the plant associations of the cliffs, screes, rhododendron moorland and iris meadows. Several plants of each of the following genera are briefly described, *Campanula, Codonopsis, Cyananthus, Cypripedium, Didissandra, Gentiana, Incarvillea, Iris, Meconopsis, Nomocharis, Pedicularis, Potentilla, Primula* (66 spp.), *Rhododendron* (51 spp.), *Roscoea,* and *Saxifraga.*—*C. W. Dodge.*

BOTANICAL EDUCATION

C. Stuart Gager, *Editor*
Arthur H. Graves, *Assistant Editor*

(See also in this issue Entries 7565, 7582, 7600, 7634, 7636, 7656, 7671, 7910)

7538. Beer, G. R. de. **Introduction to the study of genetics. Part III.** School Sci. Rev. [London] 5: 211–215. 1924.

7539. Воч, Ганешин и В. Л. Комаров, [Boch, Ganeshin, and V. L. Komarov.] **Что может заготовить в течение лета школа для оборудования преподавания ботаники.** [What one may prepare during the summer for the teaching of botany in school.] Вестник наглядных пособий. [Messenger of practical assistance] 1: 33–38. 1919.

7540. Ганешин, С. С. [Ganeshin, S. S.] **О гербарных таблицах по морФологии и биологии.** [Plates from the herbarium for morphology and biology.] Вестник Наглядных пособий. [Messenger of practical assistance] 1: 32–36. 1920.

7541. Späth, Hellmut. **Braucht Deutschland eine Hochschule für Gartenbau?** [Does Germany need a higher institution for horticulture?] Gartenwelt 27: 81–83, 95–96, 102–103, 110–111, 118–119. 1923.—An extensive exposition is given as to the desirability of a foundation for higher education in Germany. During the last 4 years the German horticultural periodicals have contained many contributions regarding the question as to whether Germany should have such a horticultural institution.—*J. C. Th. Uphof.*

7542. Thoday, D. **Botany: a text-book for senior students.** *544 p., 230 fig.* Univ. Press: Cambridge. 1921.—The purpose of this text is primarily for use in connection with the Senior Cambridge (England) Local Examinations, and also for students in upper grades of secondary schools. No previous knowledge of botany is assumed. A necessary minimum of physics and chemistry is supplied. Throughout the book it is assumed that experiments will be performed by the students or demonstrated to them. Classification is approached in close connection with, and in illustration of, the problems of evolution.—The introductory chapter is entitled, "Sunflower, grass, dandelion, and horse chestnut compared; Plant organs." Section I (9 chapters) deals with "The functions of plant organs, The food of plants;" Section II (3 chapters) with "Form and Structure;" Section III (5 chapters) with "Reproduction;" Section IV (3 chapters) with "The Classification of plants;" Section V (5 chapters) with "Plants in relation to their environment;" and the supplement (4 chapters) with "Seedless plants," beginning with Algae and concluding with Pteridophyta.—*C. S. Gager.*

CYTOLOGY

Gilbert M. Smith, *Editor*

(See also in this issue Entries 7678, 7927, 7954)

7543. Bagchee, Krisnadas. **The spermatogenesis of Anthoceros laevis L.** Ann. Bot. 38: 105–112. *Pl. 6.* 1924.—The final division of the spermatid may be either oblique as in other Hepaticae, or regular, the 2 kinds of division taking place side by side. The spermatids are separated only by a hyaline membrane, no true wall being formed. The blepharoplast arises from the main body of chromatin and disappears as soon as the cilia are visible. The chromosome number is 4.—*W. P. Thompson.*

7544. Cowdry, E. V. **The distribution of Rickettsia in the tissues of insects and arachnids.** Jour. Exp. Med. 37: 431–456. 1923.—Rickettsia-like bodies were found in 19 out of 111 species of insects and arachnids. Species harboring *Rickettsia* differ widely in diet and habitat. Some are entirely insectivorous, some are partly insectivirous and partly vegetarian, some are entirely vegetarian, and some subsist wholly upon a diet of mammalian blood. In only a few cases is *Rickettsia* associated with diseases in mammals. The evidence simply leads to the conclusion that the Rickettsias mentioned are true Gram-negative microorganisms easily distinguishable from mitochrondria and all other cytoplasmic and nuclear granulations, that they are rather completely adapted to an inter-cellular existence, exhibiting in some cases a remarkable degree a host specificity, and are often inherited through the eggs.—*C. S. Hoar.*

7545. Janssens, F. A. **La chiasmatypie dans les insectes.** [Chiasmatypy in insects.] La Cellule 34: 135–359. *21 pl. (5 col.)* 1924.—In the spermatogonia of *Stethophyma grossum* (*Mecostethus grossus*) there are 22 autosomes and one X-chromosome. In all chromosomes the point of insertion is terminal and is marked by a "proximal granule." The leptotène filaments run parallel with their proximal ends toward the centrioles (each chromosome clearly forms but one filament), and become associated to form 11 bivalent dyads; this is not a reassocia-

tion of the halves of previously split chromosomes. The union is close at only 1 point; elsewhere the threads are rather widely separated and remain so into the diplotène stage when each begins to show a longitudinal split. In addition to the single permanent union which can be seen before the threads split, there may be a contact or a temporary fusion at some other point. The chromosomes are not looped and pass through no pachytène stage. When the union is at the proximal end ("proximal telosyndesis") the dyad is inserted by its middle point (the conjugation point, as indicated by the granules); here the 1st division is equational and the 2nd reductional. When the union is at the distal end ("distal telosyndesis") the 1st division is reductional and the 2nd equational. If the union occurs at some intermediate point the dyad forms a cross in which each synaptic mate makes up 1 of the vertical and 1 of the horizontal arms. Usually only 1 longitudinal half (chromatid) of each breaks and unites with a longitudinal half of the other at the crossing point. The 1st maturation mitosis is equational for the horizontal arms and reductional for the others. In such cross tetrads, therefore, chiasmatypy occurs. The composite nature of 2 of the 4 chromatids is visible at anaphase. More complex conditions may result from the presence of more than 1 chiasma. Since the various types of tetrads may occur in the same cell, each maturation division may be reductional for some chromosomes, equational for others, and partly reductional and partly equational for still others. The split X-chromosome passes to one pole in the 1st mitosis, divides equationally in the 2nd, and up to the dyad stage is closely associated with a small autosome.—In the spermatogonia of *Chorthippus* (*Stenobothrus*) *parallelus* there are 16 autosomes, 6 of them larger than the other 10, and 1 X-chromosome. The point of insertion, marked by a granule, is not the same in all. The threads form parallel pairs and pass through a typical amphitène stage into the pachytène condition. Mixochromosomes are not formed. A longitudinal split develops in the strepsitène stage. No dyad ever arises by folding of one end upon the other. In the fully formed dyads the 2 members fuse at 1 or more points which differ in location in the various chromosomes: there may be as many as 5 fusions. The sharp angle made by one chromatid as opposed to the straight course of its companion at the point of crossing, and the clear breaks which are seen in 2 of the chromatids as compared with the unbroken nature of their respective companions, afford conclusive evidence for chiasmatypy. Each of the 2 maturation mitoses is both reductional and equational—for different segments of the same chromosome. During the 2nd mitosis there is evidence that an exchange of segments occurs between the chromosomes: this "late chiasmatypy" suggests the rhegmatypy of Prell. The X-chromosome passes to 1 pole in the 1st mitosis and divides equationally in the 2nd.—The results are discussed in detail with the aid of schematic figures. The observational basis for the chiasmatype theory is regarded as adequate. The chromosomes are compound bodies whose segments may be interchanged in various ways. If fusion occurs before the splitting of the chromosomes "complete chiasmatypy" may result. The more common "incomplete chiasmatypy" (exchange between 2 of the 4 chromatids) may possibly have its inception in partial fusions of unsplit chromosomes, but it is more probable that the threads are already split (Robertson); no such split appears in the author's material, however. A further exchange may occur at the 2nd maturation metaphase, and possibly also at the 1st. Even in somatic cells (root tips) the halves of split chromosomes give evidence of chiasmatypy. Thus it may be that chiasmatypy is a general chromosomal process, which has a significance for heredity only in the meiotic phases where the elements concerned are qualitatively different.—*L. W. Sharp.*

7546. King, Shana D., and J. Brontë Gatenby. **The Golgi bodies of a Coccidian.** Quart. Jour. Microsc. Sci. **67:** 381–389. 1923.—The Golgi apparatus of the protozoan, *Adelea*, reacts in the same manner to dissolving, preserving, and staining fluids as does the Golgi apparatus in metazoan cells. During growth it spreads through the ground cytoplasm, in the form of curved, banana-shaped rods or dictyosomes. In asexual multiplication it behaves as is usual in metazoan cells It is found in every schizont and merozoit examined, always lying away from the excentric nucleolus. No evidence was found to indicate that the Golgi apparatus of the male takes part in the process of fertilization. Concerning the origin of the Golgi bodies the authors hold the following opinion: "We can not but believe

that in the early history of the cell the Golgi apparatus and the centrosome were evolved side by side, or the apparatus from the centrosphere, in some way."—*C. S. Hoar.*

7547. Mameli, Eva. **Ricerche sulla costituzione chimica della membrana delle Alghe Cianoficee.** [**Chemical constitution of the membrane in the Cyanophyceae.**] Atti Ist. Bot. Univ. Pavia Ser. II, **17**: 257–264. 1920.—Microchemical studies on 34 genera of blue-green algae, comprising about 100 species, reveal that cellulose accompanied by a pectic substance is generally present in the membrane of the Cyanophyceae. This was found both in algae growing independently and those in symbiosis with lichens. The membrane of heterocysts is also made of cellulose but does not contain pectic substances.—*P. D. Caldis.*

7548. Nicholson, F. M. **A cytological study of the nature of Rickettsia in Rocky Mountain spotted fever.** Jour. Exp. Med. **37**: 221–230. 1923.—After a thorougn study with various stains on infected tissues of guinea-pigs and after comparison with slides loaned by Dr. Wolbach, the author comes to the conclusion that the Rickettsia of Rocky Mountain Spotted Fever is easily differentiated from mitochondria, phagocytised blood pigment, nuclear debris, and all other known cellular constituents. The organism seems to have no definite relations with the nucleus or with other cellular components. Slight differences from Wolbach's account of its morphology were noted but his study of the distribution of specific lesions in guinea-pigs was confirmed and extended.—*C. S. Hoar.*

7549. Parkes, A. S. **Head length dimorphism of mammalian spermatozoa.** Quart. Jour. Microsc. Sci. **67**: 617–625. 1923.—In a large number of cases mammalian spermatozoa have been shown to be of 2 types. The type possessing the extra chromosome has a slightly larger head than the one without. Working upon man, and upon the rat, cat and mouse the author succeeds in showing the correlation between chromosome dimorphism and dimorphism in the head lengths of spermatozoa. He states that "the interest of these results lies in the probability that the histological difference in the X- and Y- spermatozoa may account for the inequality of the sexes at conception in mammals."—*C. S. Hoar.*

7550. Strangeways, T. P. S. **Observations on the changes seen in living cells during growth and division.** Proc. Roy. Soc. London B **94**: 137–141. *Pl. 2–5.* 1922.—Chick tissues observed *in vitro* show continuous activity of the cell and its internal structures, as for instance a repeated splitting and refusion of nucleoli. About 11–12 hours elapsed between the beginnings of successive mitoses. Complete division required 23–65 minutes, with an average of 34. Other average intervals observed were: beginning of prophase to clear appearance of spindle, 7 minutes; spindle to division of cytoplasm, 20; spindle to appearance of daughter nuclei, 28; persistence of balloon shape in cell, 6 minutes.—*P. B. Sears.*

ECOLOGY AND PLANT GEOGRAPHY

Geo. D. Fuller, *Editor*

(See also in this issue Entries 7537, 7614, 7620, 7628, 7638, 7640, 7641, 7642, 7645, 7646, 7653, 7701, 7715, 7788, 7821, 7822, 7857, 7859, 7865, 7981, 8030, 8031, 8032, 8038, 8075, 8084, 8090, 8092, 8094, 8099, 8106)

GENERAL, FACTORS, MEASUREMENTS

7551. Бальи, В. А., и Н. П. Кузнецова. [Bal'ts, V. A., and N. P. Kuznetsova.] **Материалы к почвенно-ботаническому обследованию Царскосельских парков и окружающих угодий.** [**Materials for investigation of the soils and botany of the parks of Tsarskoe Sel'o and neighboring pleasure grounds.**] Журнал Петроградского Агрономического Института. [Jour. Petrograd Agron. Inst.] **1**: 1–38. 1919.

7552. Битрих, А. А. [Bitrikh, A. A.] **Кольско-Кемский край, его природа и леса.** [**The Kol'sko-Kemski area, its nature and forests.**] Извѣстія Русского Географического Общества. [News Russian Geog. Soc.] **54**: 15–28. 1918 [1919].

7553. Blaauw, A. H. **The results of temperature during flower-formation for the whole hyacinth.** Part 1. Lab. voor Plantenphysiol. Onderzoek. Wageningen, Holland. **10**: 1–66. *42 fig.* 1924; and Verh. K. Akad. Wetensch. Amsterdam. Sect. 2, 23^4: 1–66. *Illus.* 1924.—The paper describes the results of an investigation concerning the influence of temperature

during the period of flower formation. Eighteen hundred hyacinth bulbs of an age to yield flowers if properly treated were used at 11 different temperatures. The data show that the initial optimal temperatures of 23°–28°C., are shifted in the later weeks of growth to 17°. A temperature of 23°–28° for more than 8 weeks is unfavorable for growth. A 2nd, higher optimum is found at very high temperatures, but it reveals itself only in the after effect. For field cultures, when both optimal leaf development and flowering are desired, the author recommends 8 weeks at 25½° and 4 weeks at 17°. A brief discussion is given of the practical value of this work for hyacinth growers.—*M. B. Morgan.*

7554. Dachnowski, Alfred P. **The correlation of time units and climatic changes in peat deposits of the United States and Europe.** Proc. Nation. Acad. Sci. [U. S. A.] 8: 225–231. 1922.—Certain correlations between peat deposits in this country and those of Europe are shown by 4 tables. Agreeing with Leverett that the Wisconsin and Würm glaciations were contemporary, the author concludes that it is possible to correlate the corresponding minor glacial stages. Since peat formed under varying conditions of dryness differs in botanical composition and in texture, a study of the layers in deposits formed during the glacial retreat serves to throw light on the character of the past climatic changes. Results of the correlation show that since the last glacial period there have been several climatic waves and probably the last wave continues to shift northward at the present time.—*M. B. Morgan.*

7555. Доктуровскій, В. С., и А. П. Черный. [Docturovski, V. S. and A. P. Cherni.] **Изслѣдованія болотъ и луговъ долины рѣки Лани, Минской губ.** [Investigations on the moors and meadows in the valley of the River Lani, Minsk Province.] Матеріалы Департамента Земледѣлія, Петроград. [Papers Dept. Agric. Petrograd.] *90 p. Fig. 1–13. 13 portraits.* 1915 [received 1923.]—This paper gives a sketch of the soils and plant geography of the bogs and meadows along the left fork of the Pripet River. The graphic method of Hult and Sernanden is used in characterizing the plant associations. The influence of flooding the bogs on the changing plant covering is described.—*Authors.*

7556. Gregory, J. W. **The ancient river system of the Kalahari and the possibility of its renewal.** [Rev. of: Schwarz, E. H. L. **The Kalahari scheme as the solution of the South African drought problem.** South African Jour. Sci. 20: 208–222. 1923 (see this issue Entry 7564).] Nature 113: 539–540. 1924.—The restoration of the ancient river and lake system of the Kalahari is regarded as feasible but its effect on climate and vegetation is questioned.—*Geo. D. Fuller.*

7557. Крашенинников, И. М. [Krasheninnikov, I. M.] **Ботаникогеографические группировки и геоморфология Южного Урала в их взаимной связи.** [Plant associations and topography of the South Ural region and their interrelations.] Журнал Новочеркасского Отделения Русского Ботанического Общетва. [Jour. Novocherkask Sect. Russian Bot. Soc.] 1: 19–37. 1919.

7558. La Gorce, John Oliver. **The fight at the timber line.** Nation. Geog. Mag. 42: 165–196. *32 illus.* 1922.—This is a finely illustrated discussion of the struggle of plant life against various forces of nature such as snow, drought, glaciers and wind.—*W. M. Atwood.*

7559. Lynch, F. C. C. **Map of the southern portion of the Dominion of Canada indicating vegetation and forest cover.** 20 × 35 inches. Dept. Interior: Ottawa, Canada. 1924.—The principal plant formations south of the tundra are mapped with decided accuracy. The forest types recognized are northern hygrophytic evergreen, northern conifer, northern mixed, eastern conifer, hardwood, mixed and Carolinian (in Southern Ontario). In addition, the transitional grove belt, the prairie grassland and the cleared portion of the mixed forest belt are delimited.—*Geo. D. Fuller.*

7560. Poisson, Henri. **Notice documentaire sur betatra.** [A note on the betatra.] Bull. Econ. Madagascar et Dépendances 20: 127–129. *8 fig.* 1923.—The "betatra" of the Tulear region of Madagascar is *Jatropha mahafalensis* Jum. and Perr., a Euphorbiaceous tree. It is widely distributed in all the "bush" of the dunes and of the calcareous hills in the southwestern part of the island extending from the shore to the steppes of the plateaus. The seed are oily and the latex yields a red astringent gum which seems to have been formerly used as a substitute for dragons blood.—*H. Jumelle.*

7561. Pope, A. **The role of the tree fern in the New Zealand bush.** Part 1. New Zealand Jour. Sci. and Tech. 7: 52–61. *4 fig.* 1924.—In this part brief accounts are given of the stations, habitats, growth forms, and utility to the Maoris of *Cyathea dealbata, C. medullaris, Dicksonia squarrosa,* and *Hemitelia Smithii.* The aerial roots from the base of the trunk are accredited with considerable strengthening power. Examples of branching specimens are given. Tree ferns often survive forest fires and assist in reforestation by affording protective shade. They often form pure communities with growth so close as to prevent almost all undergrowth.—*H. H. Allan.*

7562. Сапожников, В. В. и Е. В. Никитина. [Sapozhnikov, V. V. and E. V. Nikitina.] **Поѣздка въ низовье Оби и Обскую губу въ 1919 году (Предварительное сообщение).** [A voyage on the lower Obi and Obi Bay in 1919 (preliminary communication).] Извѣстія Института Изслѣдованія Сибири II. Труды Естественно-Историческаго Отдѣла. [Trans. Inst. Exploration of Siberia II. Contrib. Nat. Hist. Sect.] 1: 1–7. 1920.

7563. Saxton, W. T. **Phases of vegetation under monsoon conditions.** Jour. Ecol. 12: 1–38. *57 fig.* 1924.—An account is given of the ecology of a low lying area of about 36 acres close to Ahmedabad in the North of the Bombay Presidency, India, in a district with a well-marked and fairly regular summer monsoon. In it are found a number of scattered small trees and shrubs, most of the remainder of the area being covered during the early part of the monsoon by grassland which partly persists and partly gives way to a marsh phase near the end of the monsoon; this may in turn be followed by more xerophytic vegetation. In the analysis of the vegetation, Gams' concept of synusia is chiefly employed, the vegetation, which includes 161 spp. of flowering plants, being grouped in 8 synusia. The physiological anatomy of plants belonging to the more important synusia is described and figured. The bearing of the facts described upon ecological concepts in general is discussed, especially in relation to the theory of "mixed formations in time" previously published by the author. The conclusion is reached that an association is not necessarily a topographical unit, and that the synusium is to be preferred to the association as the fundamental unit of ecology.—*Author.*

7564. Schwarz, E. H. L. **The Kalahari scheme as the solution of the South African drought problem.** South African Jour. Sci. 20: 208–222. 1923.—The theory is held that as rivers have cut their way from the center of Africa the interior has been drained and the country has become increasingly arid. Evidence of recent desiccation is seen in the changing character of vegetation. It is proposed to build a dam across the Chobe Valley and thus divert water into old lake basins and old river channels. This would lead to the formation of very large lakes that would not only act as reservoirs of irrigation water but would materially affect both the level of ground water and the rainfall over large areas. It is contended that it would give the region a more humid climate and change the character of vegetation.—*Geo. D. Fuller.*

7565. Щербиновский, Н. [Shcherbinovski, N.] **Дневники Самарской природы 1916 года.** [Daily notes on nature in Samara in 1916.] *146 p.* Самарский Губернский Отдел Народного Образования [Samara District Dept. Popular Education: Samara.] 1919.

7566. Stuart, E. J. **A land of opportunities: being an account of the author's recent expedition to explore the northern territories of Australia.** Med. 8vo. xiv + 144 p. *71 fig.* J. Lane, Ltd.: London, 1923.—It contains a few notes on mangroves and other tree vegetation of the region.—*Geo. D. Fuller.*

7567. Сукачев, В. Н. [Sukachev, V. N.] **Общие задачи, программа и организация исследования растетельных сообществ долины р. Чу. Растительность долины р. Чу. I. Материалы к проекту орошения долины р. Чу в Семиреченской области, с предисловием** В. А. Васильева. [General problems, program and organization for the study of plant associations in the Chu river valley. I. Materials on the irrigation project . . . . in the Semirechensk district, with preface by V. A. Vasilev. Петроград [Petrograd], 1919.

7568. Верещагинъ, В. И. [Vereshaguin, V. I.] **Очерки Алтая III. Натуралистъ на Телецкомъ озерѣ. IV. Отъ Чемала до Тюдралы.** [Sketches from the Altai. III. A naturalist at Lake Teletskoe. IV. From Chemal to Tudral.] Сибирск. Разсвѣтъ [Siberian Dawn]. *P. 58–77, 84–98.* 1919.

7569. Warrington, Katherine. **The influence of manuring on the weed flora of arable land.** Jour. Ecol. 12: 111–126. 1924.—This study was made on fields of the Rothamsted Exp. Sta., which had carried winter wheat continously since 1852, with some comparisons with fields in barley and in roots. Methods of cultivation seem to determine the dominant weed flora, with long continued manuring of secondary importance except in special instances of the serious deficiency of some element such as N. Manurial treatment then becomes a most important factor.—*Geo. D. Fuller.*

7570. Williams, Carrington B. **A short bioclimatic study in the Egyptian desert.** Egypt Dept. Agric. Tech. and Sci. Service Bull 29. *1–20., 11 pl.* Cairo. 1923.—Observations made in a valley 12 miles southeast of Cairo, Aug. 3–10, 1922, show a great variety of temperature and humidity in a small area within a very limited time. The surface sand has a daily temperature change of 37°C. with a weekly range from 17.5 to 58.2°; in the shade the variations were 21.2 to 35.9°, and 12 m. within a cave, from 24.0 to 25.4° only. The daily range of relative humidity was as high as 14 to 80%. The temperature relations of burrowing animals and of plants are briefly discussed. The plant, *Reaumuria hirtella*, is shown to be covered with small crystals of sodium chloride which absorb water from the air when the relative humidity is above 74%.—*Geo. D. Fuller.*

7571. Жадовский, А. Е. [Zhadovski, A. E.] **Экологический спектр Костромской флоры.** [An ecological review of the flora of Kostrom.] Труды Костромского Научного Общества по изучению местного края. [Trans. Kostromskoe Sci. Soc.] 16: 49–68. [1919?]

7572. Жадовский, А. Е. [Zhadovski, A. E.] **Растительность Костромской губернии.** [Vegetation of the Kostromsk province.] Труды по установлению губернских уездних и водостних границ по экономическим признакам. [Information for the establishment of province, district, and volost boundaries for economic information.] *18 p., 1 map.* Kostrom, 1920.

STRUCTURE, BEHAVIOR, SYMBIOSIS

7573. Bailey, I. W. **Notes on neotropical ant-plants III. Cordia nodosa Lam.** Bot. Gaz. 77: 32–49. *Pl. 6–7, fig. 1–5.* 1924.—A clavate stem myrmecodomatium from Kartabo, British Guiana, is described. The wall was found to be composed of concentric rings of highly differentiated tissues the inner layers of which involve fibro-vascular elements with xylem and phloem in inverse order to the bundles in the outer part of the wall. The centripetal bundles unite with the centrifugal ones only in the apical portion of the domatium. Ontogenetically the structure was found to be produced by an invagination process originating in a leaf axil. The author compares this ant home with those on other species of *Cordia*. The one on *C. Gerascanthus* was found to be a simple medullary cavity. On certain members of the Physocladae section of the genus, the domatia are unilateral with pouch-like enlargements. In a general discussion of myrmecophytism the writer holds that these abnormalities are inherited structures which are formed without the intervention of parasitic organisms. Descriptions are given of numerous complex ecological situations which were found among the insects, fungi, and nematodes inhabiting the domatia.—*B. W. Wells.*

7574. Gluck, Hugo. **Biologische und morphologische Untersuchungen über Wasser- und Sumpfgewächse. Vierter Teil; Untergetauchte und Schwimmblatt Flora.** [Biological and morphological researches of water and swamp plants. Vol. 4. Submersed and leaf-floating flora.] *746 p., 8 pl. (2 col.), 94 fig.* Gustav Fischer: Jena, 1924.—The submersed flora includes (I) homoblastic species which are most numerous, possessing but one leaf form and divided into (1) plants with linear, flattened leaves (*Sparganium minimum, Eriocaulon septangulare*, and *Lobelia Dortmannia*), (2) plants with cylindric leaves (*Subularia aquatica* and several *Isoetis* spp.), and (3) plants with pinnately divided leaves (*Myriophyllum verticillatum, M. spicatum, M. alterniflorum, Hottonia palustris*); and (II) heteroblastic species which in the course of their life cycle develop 2 different leaf forms. The latter include species with undivided leaves (*Potamogeton* spp. and *Stratiotus aloides*) and species with divided leaves (*Ceratophyllum demersum* and *Ranunculus* spp.).—The floating leaf vegetation includes (1) heteroblastic plants (most numerous), in which divided primary leaves are succeeded by shield shaped, as in *Ranunculus radians* and *R.* spp., and undivided linear, lanceolate or

rounded leaves, by spatulate, oval or cordate ones as in *Callitriche, Nuphar, Nymphaea,* and *Potamogaton* spp.; (2) those intermediate between heteroblastic and homoblastic forms, such as *Damasonium stellatum, D. polyspermum, D. Bourgaei, Caldesia parnassifolia, Sparganium affine* and its varieties *orevistylum* and *longistylum, Aponogeton distachyus;* and (3) homoblastic forms, such as *Limnanthemum nymphaeiodes, Hydrocharis* and *Ranunculus* spp. Data are given on the life history of these water plants grown under various conditions, many from the author's investigations.—*J. C. Th. Uphof.*

7575. Lovell, John H. **Bumblebee flowers.** Maine Nat. **2**: 30–32. *1 pl.* 1922.—*Chelone glabra, Aconitum* spp., *Impatiens biflora,* and *Trifolium pratense* are fertilized chiefly by bumblebees.—*C. A. Weatherby.*

7576. Maximow, N. A., and T. A. Krasnosselsky-Maximow. **Wilting of plants in its connection with drought resistance.** Jour. Ecol. 12: 95–110. 1924.—Rejecting the hypothesis that it is possible to measure the degree of xerophytism of plants by the capacity of the leaves for transpiration, data are presented showing a connection between wilting and drought resistance. Some of the results of experiments are as follows: In xerophytic and mesophytic habitats leaves have a water deficit at midday, when the plant loses more water than it is able to absorb from the soil. When plants wilt the water deficit is little above that at midday. Xerophytic plants in wilting have a water deficit greatly exceeding the water deficit in mesophytes. The visible loss of turgescence in shade mesophytes may appear with an extremely slight decrease in the water content of leaves. In prolonged wilting, xerophytes are capable of losing half their water without harm but in mesophytes this leads to emptying and shedding of the leaves. The leaves of bog plants are unable to sustain prolonged wilting. Wilting is accompanied by an extreme reduction in the rate of transpiration and hence the most essential feature of a xerophytic organization is the capacity to resist prolonged wilting without injury.—*Geo. D. Fuller.*

7577. Oye, Paul van. **De micro fauna en flora der bladtrechters van Bromeliaceae.** [**The micro fauna and flora of the leaf rosettes of Bromeliaceae.**] Natuurwetenschapp. Tijdschr. 5: 179–182. 1923.—Citing first the organisms in the pitchers of *Nepenthes* and in the leaf bases of *Ravenela madagascariensis,* the writer observed in the water of rosettes of *Billbergia pallidiflora* Liebmann, a number of microörganisms including 3 diatoms, 4 desmids, 4 Chlorophyceae, 7 Flagellata, 7 Rhizopoda, 2 Infusoria, 2 Copepoda, 1 Nematoda, 2 insects, and also a few bacteria.—*J. C. Th. Uphof.*

7578. Oye, Paul van. **Recherches sur la biologie de Ravenala madagascariensis Sonner.** [**The biology of Ravenala madagascariensis.**] Rev. Zool. Africaine (Suppl. Bot.) 12: B18–B34. *6 fig.* 1923.—After a brief general description of the tree and the position of the water reservoirs in the petioles, the author discusses in detail the morphological structure of the leaf, petiole and sheath showing that the water must come from the plant itself and not from the rainfall. This conclusion is verified by experimental work. On examination he found that the water had no digestive function, and hence insects that happened to fall in could not be utilized as food for the plant. The maximum water capacity of a large reservoir is about 1.5 l. The water level does not vary during dry periods nor during periods of rain; it is, therefore, not reserve water for the plant. The petioles are so constructed as to give great resistance to the force of the wind and this power is augmented by having the center filled with water. The author concludes that the function of the reservoirs is purely mechanical.—*M. B. Morgan.*

7579. Weaver, John E. **Root development in the grassland formation.** Carnegie Inst. Wash. Publ. 292. *151 p., 23 pl., 37 fig.* 1920.—The grasslands are considered under 3 subdivisions of true prairie, mixed prairie, and short-grass plains. The true prairie is characterized by tall sod-forming grasses in soil of rather abundant water content, with greater moisture in the subsoil. On the basis of root development, 3 general classes may be recognized in grassland vegetation. In the 1st the "working depth," or average depth reached by a large number of roots is about 1.5 feet, with a maximum depth of 3.3 feet. The 2nd class possess roots with a working depth 3.3 feet and a maximum of about 6 feet; while in the 3rd class the working depth of the roots is usually 5–8 feet and the maximum penetration 8–12 feet, with a few species reaching an extreme of 15–20 feet. Examples of the 3 classes

are (1) *Aristida oligantha, Elymus canadensis,* and *Koeleria cristata;* (2) *Andropogon scoparius, Bouteloua gracilis, Grindelia squarrosa;* and (3) *Andropogon furcatus, Aster multiflorus,* and *Panicum virgatum.* The deeper rooted species have few roots in the surface layers of the soil, showing a grouping of roots into more or less definite layers, thus reducing competition and permitting the growth of a larger number of species.—In the short grass plains practically all plants have root systems well adapted for water absorption from surface soils. Two have roots with a working depth of less than 2 feet, 3 have working depths of 2–4 feet, and 3 have a range of 4–7 feet. Examples of the 3 classes are *Opuntia polyacantha, Bulbilis dactyloides,* and *Psoralea tenuifolia* respectively. Here the water supply is much more limited, especially in the subsoil.—The soil and moisture conditions as well as the vegetation in the mixed prairie, are intermediate between the true prairie and the short-grass plains. Compared with the true prairie, the plants are not as deeply rooted, but have usually developed a very efficient and widely spreading absorbing system in the surface soil. The root systems of cereal crops grown at many stations in true and mixed prairie and short-grass plains were also examined. The comparative amount of root development of cereals in each seems to be in true prairie 100%, in mixed prairie 80–95%, and in short-grass plains 51–79%. The experimental data are given in the form of tables, drawings, and photographs, all of excellent quality. It is recognized that variations in root development are caused by various factors, such as the chemical and physical character of soils and the evaporating power of the air. The soil factors are most effective through water content and aeration. The water relations of the various habitats were examined by Weaver using atmometers and soil moisture determinations, the latter being interpreted by means of the wilting coefficient and the hygroscopic coefficient. He calls attention to the recognized fact that many plants are able to continue to absorb water below the limits of the wilting coefficient. In fact, it is in the responses of different plants to the use of soil moisture lying between the limits of the wilting and the hygroscopic coefficients that differences appear which might be used with advantage for a most significant classification.—*Geo. D. Fuller.*

VEGETATION

7580. Bergman, H. F. **The composition of climax plant formations in Minnesota.** Papers Michigan Acad. Sci. Arts and Letters 3: 51–50. 1924.—"There are three climax associations in Minnesota,—pine forest, deciduous forest, and prairie. All successions within a climax region terminate in the same final stage, however diverse they may be in their initial stages." The pine forest climax occupies a large part of northern Minnesota. It has as its dominants, *Pinus strobus* and *Pinus resinosa.* In undrained portions the Larix-Picea stage persists as a subclimax. In the older pine forests, reproduction of the pine is not found except where openings have occurred through windfalls. The dominants of the deciduous forest climax, occupying the southeastern part of the state, are *Acer saccharum* and *Tilia americana.* Associated with these frequently are *Carya cordiformis, C. ovata, Fraxinus americana, F. lanceolata, F. nigra, Juglans cinerea, Quercus alba, Q. rubra, Q. macrocarpa* and *Ulmus americana.* Of all these the Acer and Tilia are most abundant as seedlings and young trees in windfalls. Because of lesser rainfall and greater summer evaporation the forest has not become established in the southwestern and western parts of Minnesota, which are occupied by the prairie climax. The dominant grasses are *Andropogon furcatus, A. scoparius, Atheropogon curtipendulus, Sorghastrum nutans, Bouteloua oligostachya* and *Stipa spartea.*—*Ernst A. Bessey.*

7581. Christy, Miller. **The hornbeam (Carpinus betulus L.) in Britain.** Jour. Ecol. 12: 39–94. *7 fig., 2 map.* 1924.—Confined to southeastern England the hornbeam seems indigenous in spite of the fact that a mature wild grown specimen is very seldom seen. In addition to notes on its classification and nomenclature the limitations of its range in England and on the continent of Europe are discussed in detail. Its growth habits, flowering, fruiting, association with other species, and its economic uses are carefully considered. A bibliography of 165 citations is appended.—*Geo. D. Fuller.*

7582. Cockayne, L. **New Zealand plants and their story.** 2nd ed. New Zealand Bd. Sci. and Art, Manual 1, *xvi + 248 p., 113 fig.* Wellington, 1919.—This book dealing largely with the virgin plant covering of the islands is written in popular style using a minimum of tech-

nical terms. A brief history of botanical explorations in New Zealand beginning with that of Sir Joseph Bank and Dr. Daniel Charles Solander in 1769 up to and including the work of some of the present day botanists is recorded in the 1st chapter. A general discussion of some ecological terminology is given preliminary to the descriptions of the flora and vegetation of the various formations of the island. The formations considered are (1) sea-coast, (2) forests, (3) lowland shrub, heath and rock, (4) grasslands, (5) high mountains, and (6) inland waters, swamps and bogs. Some attention is also given to the flora and vegetation of the outlying islands. Since the advent of Europeans in New Zealand, the number of species has been rapidly increased so that only those who are versed in the botanical literature of the island can tell whether a plant is indigenous or not. The leading plants and genera of the island are briefly described. The author divides New Zealand into 15 botanical districts and some interesting points concerning the vegetation of each of these are discussed. The seed plants, ferns, and fern allies may be grouped according to their origin as: (1) Endemic, (2) Australian, (3) Fuegian, (4) Malayan, (5) European, and (6) Cosmopolitan. A study of these groups throws some light on the origin of the flora. Almost nothing has been done with the fossil flora.—*M. B. Morgan.*

7583. Cockayne, L. **The vegetation of New Zealand.** In: Engler, A. und O. Drude. **Die Vegetation der Erde Sammlungpflanzengeographischer Monographien. XIV.** *xxiii + 364 p., 65 pl., 13 fig. 2 maps.* Wilhelm Engelmann: Leipzig, 1921.—The material is organized into an introduction containing a history of botanical investigations and a bibliography of over 300 titles, and 4 major parts dealing respectively with the physical geography and climate, the vegetation of primitive New Zealand, the flora and its distribution, and the history of the flora from the Jurassic period to the present time. The vegetational features of the sea coast, of the low-lands, of the mountains and of the outlying islands are considered separately, particular attention being given in each case to the leading physiognomic plants and their growth forms, the biology of the plants (including pollination, seasonal changes, epharmonic variation) and the plant formations. Conspicuous among these formations are the rain forests, including those dominated by *Agathis australis*, *Dacrydium cupressinum*, *Podocarpus* spp., and *Nothofagus* spp.; the scrub and steppe; the fell fields; and the tussock moor. Many subdivisions of these are recognized and described, with particular attention to the growth forms and ecological conditions. The floristic provinces are (1) the Kermadec, (2) the northern mainland, (3) the southern mainland, (4) the Chatham, and (5) the subantarctic. These are subdivided into 22 districts. The vascular flora comprises 1771 species of which 1322 are endemic. The other elements of the flora are Palaeozelandic, Australian, Subantarctic, Paleotropic, Cosmopolitan, and Lord Howe and Norfolk Island. Among the prominent features of this important book are the logical organization, making reference easy, the ecological view-point maintained throughout, and the excellent quality of the maps and illustrations. [See also Bot. Absts. 12, Entry 5451.]—*Geo. D. Fuller.*

7584. Доктуровский, В. С. и Н. Н. Щуковъ. [Docturovski, V. S., and N. N. Shchukov.] **Ботаническія изслѣдованія по теченію рѣки Птичъ и въ поймѣ рѣки Брагинки Минской губ. Материалы по изслѣдованію рѣкъ и долинъ Полѣсья** [Botanical investigations in the course of the Ptich River and in the valley of the Braginka River, Minsk Province. Material for the investigation of the rivers and their valleys in Polessi.] Изданіе Отдѣла Земельныхъ Улучшений Полѣсья [Publ. Dept. Land Improvement, Polessi.] 1917 [received 1923].—The authors have described the bogs and meadows of the left fork of the Pripet River, Minsk Province, and have determined the characteristic types. The most widely distributed types are the Cariceto-Acroclodietum, the Cariceto-Phragmiteto-Acroclodietum (Drepanocladietum), the Cariceto-Calamagrostideto-Acroclodietum, etc. The Agrostideto-Calamagrostideto-Sphagnetum and the Cariceto-Phragmiteto-Sphagnetum also occur. In dry meadows the most widely distributed types are the Gramineto-Climacetum and the Anthoxanthetum. The bog forests are predominantly the Alnetum, although the Alneto-Betuletum (with Sphagnum) also occurs.—*Authors.*

7585. Domin, Karel. **A phytogeographical outline of the zonal division of the Western Carpathians besides some general remarks on the main forest trees.** *43 p., 8 fig.* Faculté des Sci. Univ. Charles: Prague, 1923.—The author has outlined the zonation of vegetation in

the Western Carpathians which in general rise from a lowland of oak or mixed deciduous forest. Above this the usual zonation is (1) a submontane zone with the upward extension of the lowland forest including some admixture of beech, fir and pine; (2) a montane beech zone; (3) an upper montane spruce zone with an upper limit ranging from 1350 to 1500 m.; (4) a subalpine zone of dwarf pine (*Pinus montana*) up to 1500 to 2000 m.; and (5) an alpine zone. Not the least interesting and important part of the study consists of an analysis of the factors which cause variations in the limits of these zones or even their inversion. For example, in deep valleys the spruce may occupy the damp, cool, lower portions and be surmounted on the drier sunnier slopes by a beech zone, or either the beech or the spruce may occupy both the lower and the upper montane zones. Emphasis is also given to the variations in the altitudinal limits of the zones due to soil, exposure, and other agencies.—*Geo. D. Fuller.*

7586. Fairchild, David. **The jungles of Panama.** Nation. Geog. Mag. **41**: 131–146. *14 fig.* 1922.—A description is given of the tropical flora and fauna of Panama.—*W. M. Atwood.*

7587. Grosvenor, Gilbert. **The Hawaiian Islands. America's strongest outpost of defense—the volcanic and floral wonderland of the world.** Nation. Geog. Mag. **45**: 115–238. *16 col. pl., 134 illus.* 1924.—This is an elaborately illustrated description of the islands in which incidental descriptions are given of native and cultivated plants.—*W. M. Atwood.*

7588. Kuhnholtz-Lordat, G. **Les dunes du Gulf du Lion, essai de géographie botanique.** [Dunes of the Gulf of Lion, an essay in geographic botany.] Thesis. *307 p., 39 pl., 27 fig., 3 maps.* Univ. of France: Paris, 1923.—This work is an essay in dynamic plant geography. The author defines the Gulf of Lion by a brief geological and geographical account; then follows an analytical discussion relating the species to the environment. The development of the plant covering is narrowly limited by a very plastic edaphic environment. There exists a remarkable parallelism between the topographic variations and the evolution of the plant covering. The pioneer phases (Pro-Ammophiletum) correspond to the youthful stages of the dunes and often consist of a Salicornietum and an Agropyretum; the climax vegetation (Ammophiletum) corresponds to the adult dune stages and the Crucianelletum to the senescence of the dunes. A return to initial phases is possible, constituting the Ammophila cycle. The various transitional stages are carefully examined. The author studies successively the modifications due to dune building deposits, to forestation, and to dune movement. He attempts to solve the complex problem of the origin of invaders.—*Author.*

7589. Quick, B. E. **A comparative study of the distribution of the climax association in southern Michigan.** Papers Michigan Acad. Sci. Arts and Letters **3**: 211–243. *Pl. 20, fig. 4–5, map 2.* 1924.—The author outlines the climate and geological history of the region and comments on the origin of its flora. The general composition of the climax formation is then discussed and its distribution and detailed composition noted for various parts of the Lower Peninsula. The causes of its present distribution are shown to be related to climatic, edaphic, and historical factors. The author concludes that the differences which occur between the climax forests of the northern and southern portions of the Lower Peninsula are "not sufficient to warrant the division into two areas, each having a different climax."—*H. T. Darlington.*

7590. Stewart, Ralph R. **Alpine plants of Kashmir.** Torreya **24**: 41–44. 1924.—The author has spent 7 summers collecting in Kashmir. The same plant-zones exist as are represented in the Rocky Mountains. Characteristic species of each zone are indicated.—*J. C. Nelson.*

7591. Uphof, J. C. **The plant formations on the coral reefs along the northern coast of Cuba.** Amer. Jour. Bot. **11**: 409–416. *1 pl., 2 fig.* 1924.—The algal flora includes forms between tide marks and those at greater depths. The 1st seed plants on the rocky shore comprise very few species. Near the shore *Sesuvium microphyllum* Willd. and *Phylloxerus vermicularis* R. Br. are found, while with greater soil accumulation around rocks exposed to sea water *Salicornia perennis* Mill. and *Distichlis spicata* Greene are conspicuous. When the reefs become higher *Conocarpus erecta* L., *Borrichia arborescens* (L) DC. and *Rachicallis maritima* (Jacq) Schum. are common. Elsewhere a pure association of *Euphorbia* spp., is

developed on the rocks farther from the shore. On such places *Cuphea Parsonsia* (L)R. Br., *Lippia nodiflora* L., *L. canescens* Kth., *Ageratum maritimum* HBK., *A muticum* L., *Chenopodium ambrosioides* L., *Iresine flavescens* and *Achyranthes Maritimus* (St. Hill) Staud are also noticeable. Very characteristic is the compact growing *Heliotropium humifusum* HBK. Among the shrubs, *Tournefortia gnaphaliodes* and *Suriana maritima* are common. Mention is made of the extensive *Cocolobis uvifera* formation and the more inland shrub association. —*Author.*

7592. Woodard, John. **Origin of prairies in Illinois.** Bot. Gaz. **77**: 241–261. 1924.—These prairies are regarded as being in a region with a woodland climate and in their origin closely associated with the ice sheets which in the past have covered the area. Tundra is supposed to have developed along the border of the ice sheet, forming a wide border in the level country southwest of Lake Michigan. With the retreat of the last ice sheet and as the climate moderated the bordering tundra was invaded by other vegetation—the forest trees occupying the hilly areas of Ohio and Indiana, the prairie grasses the plains farther to the west. The forests in turn began the invasion of the plains that extended as far east as Ohio. The low morainal hills and depressions of Ohio and Indiana favored tree invasion more than did the plains of Illinois. Hence towards the west the trees were limited to the stream valleys. Fires may have checked the invasion of forests into prairies but the prairies did not originate by the destruction of forests by fire. This invasion of Illinois prairie by forests is still in progress.—*Geo. D. Fuller.*

FORESTRY

W. N. Sparhawk, *Editor*

(See also in this issue Entries 7516, 7552, 7559, 7566, 7580, 7581, 7582, 7585, 7589, 7592, 7765, 7786, 7831, 7832, 7853, 7863, 7873, 7883, 7884, 7887, 7900)

7593. Anonymous. **Angelique—a wood that resists the attack of the teredo.** Sci. Amer. **129**: 319. *1 fig.* 1923.—This is an account of tests of angelique (*Dicorynia paraensis* Benth.) in Dutch Guiana.—*Chas. H. Otis.*

7594. Anonymous. **Der neueste preussische Forstkulturgesetzentwurf. [Proposed forestry law for Prussia.]** Deutsch. Forstzeitg. **39**: 633–634. 1924.—The most important provision is the extension of State supervision over all privately owned forest and waste land, with the requirement that it be handled in such a way as to maintain or increase the productivity of the soil. The objects and methods of management, choice of species and rotations are to be left to the owners, but working plans must be prepared and approved by the local supervisory officials, consisting in each case of a State forester with an advisory committee of owners. A record must be kept of the cut from all tracts exceeding 10 hectares, forest may not be cleared without a permit, denuded areas must be reforested within 4 years, and appointment of a technical forester may be required for tracts above a certain size.—*W. N. Sparhawk.*

7595. Anonymous. **Der Stiewingsche Saatrevolver. [Stiewing's seed planter.]** Deutsch. Forstzeitg. **39**: 676–677. *2 fig.* 1924.

7596. Anonymous. **Descubrimiento de una planta propia para curtiduria. [Discovery of a plant suitable for tanning.]** México Forest. **2** [13–14]: 24. 1924.—Tests recently completed at the Experimental Industrial Laboratory of Mexico show that *Potentilla candicans* H. & B., known as *suelda con suelda*, contains 26% of tannin, and yields an extract claimed to be superior to that of quebracho. It can also be used for coloring leather. The plant is easy to cultivate and reproduces rapidly.—*W. N. Sparhawk.*

7597. Anonymous. **Progress report of forest research work in India for the year 1922–23, including the administration report of the Forest Research Institute, Dehra Dun.** *123 p.* Simla, 1924.—Among the important accomplishments in silvicultural research are the preparation of new yield tables for sal, improvements in planting technique, installation of many new sample plots, investigation of early thinning in teak, and remeasurement of many sample plots. Much work is under way in nearly all the provinces. Studies in mixtures of different species, particularly as a protection to sal, are of interest. Great progress is reported in

investigations dealing with timber mechanics, seasoning, technology, minor products, etc. Work in forest botany and entomology is also reported.—*S. B. Show.*

7598. Anonymous. **Squeezing softwood to make it hardwood.** Sci. Amer. **129:** 319. *2 fig.* 1923.—The manufacture of "lignostone" is described. It is used for golf clubs, loom bobbins, walking sticks, etc.—*Chas. H. Otis.*

7599. Anonymous. **The gipsy moth and dead trees.** Sci. Amer. **129:** 99. 1923.—The establishment of a barrier zone is proposed to prevent the spread of the moth in New York State.—*Chas. H. Otis.*

7600. Anonymous. **Vorbildung für den Forstverwaltungsdienst in Bayern.** [Preparation for the Bavarian forest service.] Forstwiss. Centralbl. **46:** 225–228. 1924.—This is an official notice outlining the training and experience required of candidates for technical positions in the State forest service.—*W. N. Sparhawk.*

7601. Altona, T. **Djati en Hindoes.** [Teak and Hindoos.] Tectona **16:** 237–263. *Fig. 4.* 1923.—The author tries to show that *Tectona grandis* is not a native of Java, but was introduced from British India by the Hindoos. His conclusions are based partly on ethnological and philological studies, and partly on the fact that many of the old teak forests show traces of plantation, while none have been examined by the writer that could not be proved to have been planted.—*Ch. Coster.*

7602. Арциховскій, В. М. [Artsikhovski, V. M.] **Объ организаціи на Дону степныхъ заповѣдниковъ и научной станціи при нихъ.** [Organization of the forest reserves and the scientific station on the Don Steppes.] Журналъ Новочеркасскаго Отдѣленія Русскаго Ботаническаго Общества [Jour. Novocherkassk Sect. Russian Bot. Soc.] **1:** 1–11. 1919.

7603. Auerhan, Jan. **Příspěvky ke statistice lesů v Republice Československé.** [Forest statistics of Czechoslovakia.] (Summary in French) *102 p.* Nákladem Státního úřadu statistického [State statistical bureau]: Prague, 1924.—Detailed statistics by provinces and subdivisions are given as of 1920 for forest areas, ownership, sizes of holdings, kinds of timber, forms of management, rotations, distribution of age-classes, annual growth, and annual cut. The total forest area is 4,662,790 hectares, including some land not wooded. The State owns 15.3%; private individuals 56.8%, communities 9.4%, and churches, institutions, and associations, 18.5%. Conifers occupy 54.6% of the area, broad-leaved trees 29.8%, and mixed forests 15.6%. *Picea excelsa* occupies 39.2% of the total, *Pinus silvestris* 14.2%, *Abies pectinata* 8.0%, *Fagus silvatica* 20.7%, *Quercus* spp. 8.2%, and miscellaneous species 9.7%. Approximately 75% of the forest is under definite working plans. The smaller holdings, especially those in private ownership, are handled less systematically, under shorter rotations, and have a less satisfactory distribution of age classes than the larger tracts. Their average yield is also considerably less. For the entire country the average annual increment is 3.4 cu.m. per hectare, of which 53.4% is timber and 46.6% firewood. The total increment is 14,043,756 cu.m., the annual cut 13,315,232 cu.m., leaving out part of the forests in Slovakia and Sub-Carpathia, for which data are lacking. Statistics are also given for the production of oak and pine bark and forest litter.—*W. N. Sparhawk.*

7604. Averill, R. [W.], W. B. Averill, and W. I. Stevens. **A statistical forest survey of seven towns in central Massachusetts.** Harvard Forest Bull. **6:** *39 p., 1 fig.* Harvard Forest, Petersham, Massachusetts, 1923.—Tables show (1) areas of forest, classified by types, ages, and density of stocking; (2) amount of standing timber, classified by types and age classes; (3) succession of types following cutting on light and heavy soils; and (4) annual increment. On sandy soils gray birch (*Betula populifolia*) is not a menace to *Pinus strobus* reproduction on cutover pine areas, while on heavier soils it is a serious handicap. Abandoned fields, regardless of soil, are occupied by pine more often than by birch. In the mixed pine-hardwood type more than ½ of the cutover areas reproduced to pure hardwoods, while the transition and swamp hardwoods have generally perpetuated themselves unchanged. To secure evenly distributed pine reproduction following cutting, it will be necessary to dispose of the slash, which occupies ⅓–½ of the area and decomposes slowly.—*W. N. Sparhawk.*

7605. B. **Die Stockrodung.** [Clearing stumps.] Deutsch. Forstzeitg. **39:** 588–590. 1924. —The practice of clear-cutting, stumping, and planting has resulted in deterioration of the site quality in Saxon spruce forests to the extent of reducing the average annual increment

by 1 cu.m. per hectare. Pulling or blasting of stumps tends to destroy the structure of forest soil, reduces the amount of decaying vegetable matter, and hinders the activity of numerous micro-organisms.—*W. N. Sparhwak.*

7606. Berkhout, A. H. **Das Bestandesmittelstammverfahren. [The mean sample tree method as applied to a stand.]** Centralbl. Gesam. Forstw. **46**: 287–291. 1920.—Berkhout considers this one of the best methods of obtaining the volume of even-aged, fairly normal stands. Beekman of the Dutch Forest Exp. Sta. in Java has found it to be a practical method for determining volume, height, and site quality of stands, while Udo Mueller asserts that the method does not offer a reliable index. Flury's investigations in spruce and beech stands are discussed in detail, showing the deviation percentage of the mean sample tree method compared with the actual volume of the stand. It is pointed out that 2–3 sample trees will give an average close enough for all practical purposes.—*R. H. Weidman.*

7607. Besley, F. W. **Should we use Christmas trees?** Amer. Forest. **29**: 741–743. *4 fig.* 1923.

7608. Borchers, B. B. **When wood shrinks.** Sci. Amer. **129**: 250. *6 fig.* 1923.—A motion picture film shows the changes taking place during seasoning.—*Chas. H. Otis.*

7609. Busse. **Ein bisher wenig beachteter Schädling des Douglasiensamens. [A hitherto unnoticed enemy of Douglas fir seed.]** Deutsch. Forstzeitg. **39**: 559. 1924.—The poor germination of seed of *Pseudotsuga taxifolia* is due partly to larvae of a small wasp (*Megastigmus spermotrophus* Wachtl.) which eat out the inside of the seed. The insect was introduced from America with seed and thrives in Germany where up to 22% of locally collected seed is infested. If the seed are kept in a fairly warm room for a short time during the winter the insects will emerge and can be killed; in this way non-infested seed may be sown.—*W. N. Sparhawk.*

7610. Busse. [Rev. of: Anonymous. **Hilfstabellen für Forst-Taxatoren. (Foresters' tables.)** Forstabteilung des badischen Finanzministeriums, Karlsruhe, 1924.] Deutsch. Forstzeitg. **39**: 644–646. 1924.—As Baden bases the cut from her state forests on the actual growth, great care is used in obtaining accurate forest statistics. Site quality is classified on the basis of mean annual growth at 100 years, using heights of the larger trees as indicators. There are 13 site classes for spruce and fir, 10 for pine, 9 for beech, and 6 for oak. Busse questions the practicability of such refinement.—*W. N. Sparhawk.*

7611. Busse. [Rev. of: Dressler, William. **Zopfungstabelle als Holzsparer. ("Topping tables" as a means of saving wood.)** J. Neumann: Neudamm, 1924.] Deutsch. Forstzeitg. **39**: 615–616. 1924.—It is frequently possible to obtain a greater measured volume of wood from a tree by cutting off part of the top log, the resulting increase in middle diameter more than compensating for decrease in length. Where logs are graded by diameter or volume classes, cutting off the top may also raise the grade and consequently the selling price. The author's measurements indicate that $\frac{4}{5}$ of all the stems in an average stand could be cut up to better advantage than is usually the case, and that the gain in volume should be at least 6%, and in value 18%.—*W. N. Sparhawk.*

7612. Buys, C. Brandts. **Mededeeling over Pinus Merkusii, in verband met de mogelijkheid van het vestigen van een terpentijn en Harsindustrie in Ned. Indie. [Notes on Pinus Merkusii, and the possibility of establishing a turpentine and rosin industry in the Dutch East Indies.]** Tectona **17**: 357–371. *Fig. 4.* 1924.—The stands of *P. Merkusii* in Sumatra average about 800 cu.m. to the hectare. They are too far from the consuming centers for profitable exploitation of the timber, but may become important sources of resin. The yield in turpentine is not less than that of American yellow pine, and the product closely resembles French turpentine.—*Ch. Coster.*

7613. Byers, C. A. **While the giant redwoods grow.** Amer. Forests and Forest Life **30**: 23–25. *4 fig.* 1924.

7614. Cashen, Dorothy J. **Growth of Pinus resinosa and Pinus strobus.** Papers Michigan Acad. Sci. Arts and Letters **3**: 67–85. *Pl. 15, 1 fig.* 1924.—The timber, about Douglas Lake, Michigan, is largely 2nd growth pine and hardwood. Measurements in height and thickness were made in 1922 of juvenile growth of *Pinus resinosa* and *P. strobus*, by measuring the distance between nodes and by borings into the trunks of representative trees in each of 6

areas. Most of the trees started during 1904–1911, though some started in nearly every year, except when there were burns, from 1889 to 1922. *P. resinosa* led in both height and diameter growth. Hydrogen-ion tests indicate that soil acidity has little effect on growth of these species.—*Ernst A. Bessey.*

7615. Cieslar, A. **Über den Einfluss des Waldes auf den Stand der Gewässer. [Influence of forests on stream-flow.]** [Rev. of: Engler, Arnold. **Untersuchungen über den Einfluss des Waldes auf den Stand der Gewässer.** Mitteil. Schweiz. Zentralanst. Forst. Versuchsw. **12:** 1–626. *58 pl.* 1919 (see Bot. Absts. 9, Entry 710).] Centralbl. Gesam. Forstw. **46:** 337–359. 1920.

7616. Clapp, Earle H., and Charles W. Boyce. **How the United States can meet its present and future pulpwood requirements.** U. S. Dept. Agric. Bull. 1241. *1–100. 29 fig.* 1924.—This is an economic study of the present and prospective pulpwood, wood-pulp, and paper requirements of the U. S. A., the sources of supply, and the problems of producing adequate domestic supplies of raw material.—*W. N. Sparhawk.*

7617. Coolidge, Karl R. **The life-history of Mitoura loki Skinner (Lepid.: Lycaenidae).** Entomol. News. **35:** 199–204. 1924.—Notes on the distribution of *Juniperus californica* Carr., the host plant of the larva of this butterfly, are given.—*O. A. Stevens.*

7618. Coster, Ch. **Het watergehalte en de waterverdeeling van den verschen djatistam. [Moisture content and distribution in living teak.]** (With a summary in English.) Reprint from Tectona **16:** (1–111). *Fig. 1–21.* 1923.—To study seasonal variation, 2 trees of 20-year old *Textona grandis* were felled during each month from April 1922 to March 1923, and the moisture content (in percentage of oven-dry weight) was determined for each centimeter of a strip through the heart at 0.5 and 3.5 m. above the ground. Moisture content was also determined for heartwood, sapwood, and bark at 0.5, 3.5, 6.5, and 9.5 m. for ten 25-year old trees felled in the dry season and for 10 felled in the wet season. To obviate irregularities due to differences in specific gravity the moisture content of these samples was computed in terms of percentage of cell cavity filled with water, using the formula $V = \frac{S(P-20)}{1-\frac{S}{1.56}}$, where S is specific gravity of the dry wood and P the percentage of moisture based on dry weight. Great variation in moisture was found both for individual trees and for different samples from the same tree; in general, however, heartwood averaged about 100% moisture (based on weight) regardless of season, sapwood averaged 80% and 100% during the dry and wet seasons, respectively, and bark averaged 140% in the dry, and 210% in the wet season. For 136 observations of percentage of cell-cavity filled with water, heartwood exceeded sapwood on the average by $12.43 \pm 0.76\%$. No regularity was found in the vertical distribution of moisture, studied at 3 m. intervals on 5 other trees. Specific gravity decreased from the base upward, with a marked increase near the crown. Other work along these lines is discussed, particularly that of W. G. Craib, R. Hartig, and D. H. Immink.—*W. N. Sparhawk.*

7619. Escherich, K. [Rev. of: Wolff, Max, und Anton Krausse. **Die forstlichen Lepidopteren. (Forest Lepidoptera.)** *vii + 337 p.* Gustav Fischer: Jena, 1922.] Forstwiss. Centralbl. **46:** 224–225. 1924.—The sections dealing with the biology of important forest Lepidoptera and with their parasites should be especially valuable for foresters.—*W. N. Sparhawk.*

7620. Fabricius. [Rev. of: Rubner, Konrad. **Die pflanzengeographischen Grundlagen des Waldbaus. (The phytogeographical basis of silviculture.)** *273 p., 2 maps.* J. Neumann: Neudamm, 1924.] Forstwiss. Centralbl. **46:** 78–81. 1924.—The reviewer holds that the ground water level is a less decisive factor in plant distribution than the power of adsorption of the soil tributary to the root systems. He also questions the statement that mixed forests are almost always the rule in nature. The use of phenological data is commended; isophanes may prove exceedingly useful in silviculture. [See also Bot. Absts. 13, Entry 4953.]—*W. N. Sparhawk.*

7621. Gerry, Eloise and T. R. Truax. **What makes glue stick?** Sci. Amer. **129:** 102. *5 fig.* 1923.—The roles played by the wood and by the adhesive are indicated.—*Chas. H. Otis.*

7622. Graf zu Leiningen, Wilhelm. **Über das Tannensterben im Wiernerwalde.** [Dying of firs in the Wienerwald.] Forstwiss. Centralbl. 46: 173–183. 1924.—The death of large numbers of old firs (*Abies pectinata*) during the dry years 1917 and 1921 has been ascribed to bark beetle and fungus attacks and to drought. The writer shows that only about 500 mm. of rain (60–70% of normal) fell during each of the 2 years, that little of it came during the growing season, that the predominantly heavy soils and steep slopes prevented accumulation and storage of the winter precipitation, and that the root systems of fir on the local soils were in most cases extremely shallow, therefore incapable of using moisture in the deeper layers. The damage was slight on the light soils. As bark beetles (*Ips curvidens*) were not at first found on trees just beginning to show signs of ill health, it was concluded that the beetle and fungus attacks were secondary. Later, however, the breeding of large numbers of beetles on these areas led to primary attacks on healthy trees. The soils of the district are described in detail.—*W. N. Sparhawk.*

7623. Graves, H. S. **A forest policy—The immediate necessity.** Amer. Forest. 29: 708. 1923.—The American Forestry Association urges immediate federal action for: (1) More public forests, national in scope and on a scale commensurate with the public interests involved; (2) better forest fire protection of private lands; and (3) utilization for forest purposes of all federally owned lands, chiefly valuable for growing timber.—*Chas. H. Otis.*

7624. Greeley, W. B. **Balancing the forest ledger.** Amer. Forest. 29: 709–713. *4 fig., 4 charts.* 1923.—The U. S. A. is consuming 60 billion feet of timber annually and is replacing only 25% of this cut by new forest growth. To balance the ledger, it will be necessary to reduce our consumption of forest products; to reduce waste in using wood; and to produce much more timber than we are now growing.—*Chas. H. Otis.*

7625. Greeley, William B. **Idle land and costly timber.** U. S. Dept. Agric. Farmers Bull. 1417. *21 p., 9 fig* 1924.—This is a popular summary of the present forest situation in the U. S. A., with recommendations.—*W. N. Sparhawk.*

7626. Greswell, E. A. **Progress report on forest administration in the North-West Frontier Province for the year ending 31st March, 1922.** *3 + ii + 19 + xxvii p.* Peshawar, 1922. The report details the work of the Provincial Forest Service, with summaries of the more important accomplishments and problems.—Progress in revision of working plans is reported. Fires burned 40.5% of the area under protection. Development of departmental exploitation of timber continued, and large stocks accumulated because of the poor market.—*S. B. Show.*

7627. Greswell, E. A. **Progress report on forest administration in the North-West Frontier Province for 1922–23.** *3 + 5 + iii + 22 + xlii p.* Peshawar, 1923.—The report details the work of the Provincial Forest Service with summaries of the more important accomplishments and problems. Good progress in revision of working plans is reported. Forest offenses increased, but departmental protective burning was successful. The outturn of timber decreased due to a depressed market, while fuelwood for local consumption continued to be an important product. Resin tapping is becoming important.—*S. B. Show.*

7628. Harshberger, John W. **The gardens of the Faeroes, Iceland, and Greenland.** Geog. Rev. 14: 404–415. 1924.—The native and introduced vegetation is described and the effects of spring frosts and sharp winds are discussed.—*S. B. Show.*

7629. Heck. **Beiträge zur forstlichen Zuwachskunde-Zweiter Teil.** [The study of forest increment—Part 2.] Forstwiss. Centralbl. 46: 26–40, 67–77, 145–156, 211–219. *3 fig.* 1924.—The writer discusses the results of a study of 1263 increment borer cores from oak, beech, ash, fir, spruce, pine, larch, and miscellaneous hardwoods and softwoods, classified according to crown class, stand, density, and altitude. Average decade ring widths are given in detail, classified in the same way and by diameter of the stem. He considers it important to record the crown class and stand density with every core taken in increment studies. The relation of crown width to stem diameter (k:d) is most significant as an indicator of the tree's place in the stand and bears a close relation to increment, usually falling with increasing diameter (d. b. h.), especially in the case of conifers. Results of about 1000 measurements of this ratio are analyzed. With adequate data it will be possible to construct graphs showing the relation of crown breadth (spacing) to stem diameter, and the width of annual or decade rings to be expected for different diameters with any crown class or degree of density. The results of

such studies will furnish data that will be extremely useful in forest management.—*W. N. Sparhawk.*

7630. Herrmann. [Rev. of Hawelik, Karl. **Technische Eigenschaften des Nonnenholzes. (Technical properties of wood from trees killed by the nun-moth.)** Centralbl. Gesam. Forstw. 49: 185. 1923.] Deutsch. Forstzeitg. 39: 518–519. 1924.—According to Herrmann, the death of nun-infested spruce and fir trees is the result of starvation and drouth following repeated defoliation, rather than to overheating of the cambium on the twigs and branches exposed to direct sunlight, as asserted by Hawelik.—*W. N. Sparhawk.*

7631. Heske, F. **Die Bewältigung einer Windbruchs-katastrophe. [A windfall catastrophe.]** Centralbl. Gesam. Forstw. 46: 218–225, 257–282. 1920.—Violent winds, with velocities of 40–60 miles an hour, on November 25, 1917, and January 16, 1918, devastated the forests of Bohemia, doing the most damage in the Ernstbrunner and Christianberger districts. Over 150,000 cu.m. of timber were windthrown on an area of 3250 hectares. The forests are predominantly spruce, yielding 700 cu.m. per hectare at maturity. The problem of logging and utilizing the windthrown timber is discussed in detail.—*R. H. Weidman.*

7632. Hilff, G. G. **Wie muss der waldbauliche Betrieb bei den Aufgaben und technischen Anforderungen der Gegenwart ausgestaltet werden? [Adaptation of forestry operations to present needs.]** Deutsch. Forstzeitg. 39: 608–612, 634–637, 662–665. 1924. This is a plea for the adoption of the principles of scientific management, as developed by F. W. Taylor, Henry Ford, and others, in German forestry work.—*W. N. Sparhawk.*

7633. Hönlinger, H. **Zum Methodenstreit in der Statik. [Controversy over methods of forest statics.]** Centralbl. Gesam. Forstw. 46: 291–296. 1920.—Valuation formulae are used in great detail to support Hönlinger's theory of soil rent.—*R. H. Weidman.*

7634. Illick, Joseph S. **Guide to forestry, Book 1.** Pennsylvania Dept. Forest. Bull. 26. *83 p., 43 illus.* 1922.—This is a popular treatise on the forests of Pennsylvania, and the march of forest destruction. It outlines the field of forestry, discusses the origin, behavior, and prevention of forest fires, forest planting, and the identification of native trees. The pines, maples, and other selected trees are described.—*Author.*

7635. Jennings, O. E. [Rev. of: Illick, Joseph S. **Pennsylvania trees.** Pennsylvania Dept. Forest. Bull. 11. 4th ed. 1924. *237 p. 119 pl., 126 fig.* Harrisburg, 1923.] Torreya 24: 52–54. 1924. The book is without a peer as a comprehensive handbook of the region.—*J. C. Nelson.*

7636. Jones, R. Chapin. **Common forest trees of Virginia.** Virginia Geol. Comm. Office State Forester Bull. 26. *64 p.* 1922.—The important characteristics of 62 common native forest trees of Virginia are briefly described in non-technical language in this pocket manual.—*C. F. Korstian.*

7637. König. [Rev. of: Herrmann, E. **Tabellen zum Bestimmen der wichtigsten Holzgewächse des deutschen Waldes und einiger ausländischen angebauten Gehölze nach Blättern und Knospen, Holz und Sämereien. (Keys for identification of German and some exotic trees by means of foliage, buds, wood, and seeds.)** 2nd ed. *76 p., 8 pl.* J. Neumann: Neudamm, 1924.] Deutsch. Forstzeitg. 39: 593–594. 1924.

7638. Krauss, G. **Zur Aziditätsbestimmung in Waldböden. [Determination of acidity in forest soils.]** Forstwiss. Centralbl. 46: 85–98, 137–145. *1 fig.* 1924.—Free ("Austausch") and "hydrolytic" soil acidity, so important in connection with lime and fertilizer requirements of agricultural soils, are of little significance for forestry because it is impracticable to treat forest soils with fertilizer or lime. Actual acidity, expressed in terms of H-ion concentration, is more important. The pH determination has been difficult for German scientists because of the cost of the electrometric apparatus and the too refined nature of the method; the color series required for the colorimetric method has only recently become available from German chemists.—Technique of soil sampling is far more important for forest than for agricultural soils because of the wide variation both horizontally and vertically, even within the same stand. The writer's investigations do not bear out Carsten Olsen's assertion that depth of the sample makes no material difference; several series of acidity measurements taken at different points in the soil profile show a certain regularity of the trend of acidity for a given species and site. Under spruce, acidity is greatest at the surface, while under beech it increases with

depth to about 10 cm., from which point there is little difference between the 2 species. Comparative tests showed a similar vertical variation for free acidity. A study of CO_2 pressures corresponding to various pH readings leads to the conclusion that while CO_2 in the soil atmosphere may be in a slight degree responsible for acidity, it is never sufficient to account for the high acidity of surface layers under spruce. This must be attributed to organic acids resulting from slow decomposition of the litter.—Olsen's demonstration of the differences in pH requirements for different plants indicates that the plant-indicator theory has a measurable basis, though it should be remembered that the acidity of the zone of tree roots is seldom the same as that of the layers utilized by surface vegetation. While acidity does not appear to be directly a limiting factor for coniferous trees, it may affect them indirectly through its effect on the biology of the soil—earthworms, nematodes, plant diseases, etc. This suggests an important field for forest research.—*W. N. Sparhawk.*

7639. Künanz, Hermann. **Bestandesdichte und Produktionsdauer. [Stand density and period of production.]** Forstwiss. Centralbl. **46:** 183–200, 237–264. 1924.—The results of moderate (B) and heavy (C) thinnings are discussed. On the basis of Schwappach's and Wimmenauer's yield tables for spruce, pine, beech and oak, it is shown that heavy thinnings, begun while the stand is young and repeated frequently, not only may give a considerably greater total yield, but even assuming an equal yield, have other important advantages. They cause the current and mean annual growth to culminate later, the rate of growth (in volume, value, and quality) to be greater and to fall off more slowly, and the maximum soil rental value to be attained with rotations 20–50 years longer than under light thinnings. As the growth curve is more flattened at its apex, greater latitude is allowed in fixing the age of financial maturity. Rotations of 80 years for spruce, 100 for pine, 120 for beech, and 140 or more for oak are financially feasible (3% return) with intensive thinnings, but not otherwise. These ages correspond with the most favorable ages for securing natural reproduction.—*W. N. Sparhawk.*

7640. Larrea, Carlos M. **Geographical notes on Esmeraldas, Northwestern Ecuador.** Geog. Rev. **14:** 373–387. 1924.—The effect of constant warmth and humidity on the forests and other vegetation is discussed.—*S. B. Show.*

7641. Larsen, J. A. **Why hardwoods do not grow naturally in the West.** Excerpts from Idaho Forest. **4:** 28–32. 1922. Monthly Weather Rev. **52:** 218. 1924.—Precipitation and atmospheric moisture in the western U. S. A. are insufficient for the eastern hardwoods. Frost stunts or kills back saplings and retards the growth of older trees.—*E. N. Munns.*

7642. Luytjes, A. **Een en ander over den begroeiingstoestand van Noord Sumatra en over het voorkomen van den Pinus Merkusii aldaar. [Forest conditions of north Sumatra and the distribution of Pinus Merkusii.]** Tectona **17:** 323–351. *Fig. 6.* 1924.—In northern Sumatra many upland districts in the mountains are entirely devoid of forest, possibly as a result of geological conditions. These areas are increasing, due to fire and clearing for agriculture. *P. Merkusii* is most abundant in Atjeh where it reaches 2° south latitude. In the mountains it is found on steep slopes or in openings in virgin forest up to 200 m. altitude. On abandoned clearings it occurs in open stands or as scattered individuals down to 250 m. Efficient fire protection would enable the pine to spread over the open areas, and would allow the broad-leaved species to come in under the pine and later to replace it.—*Ch. Coster.*

7643. McNary, Charles L., George H. Moses, James Couzens, Duncan U. Fletcher, and Pat Harrison. **Reforestation.** Senate Rept. **28,** 68th Congress, 1st Session (Pursuant to Senate Resolution 398, 67th Congress). *29 p.* Gov't Printing Office: Washington, D. C. 1924.—This is the report of a committee appointed "to investigate problems relating to reforestation, with a view to establishing a comprehensive national policy for lands chiefly suited for timber production."—*W. N. Sparhawk.*

7644. Mason, D. T. **Forest crops as railway tonnage.** Amer. Forests and Forest Life **30:** 36–37, 53. *2 fig.* 1924.

7645. Münch. **Verhalten der Nachkommen fremden Kiefernrassen in zweiter Generation. [Behavior of offspring of foreign races of pine in the second generation.]** Forstwiss. Centralbl. **46:** 45–54, 125–137. *3 fig.* 1924.—From 1888 to 1908 much foreign pine seed (*P. silvestris*) was sown in Germany. The greater part of it, especially that from France, Hungary,

the Tyrol, Scandinavia, and Finland was from strains (races) of pine unsuited to German conditions, with the result that several hundred thousand hectares of plantations consist of scrubby, slow-growing trees that may never make good timber. Belgian and domestic (Palatinate) seed gave the best results. Several series of experimental sowings of seed from trees of various races demonstrated conclusively that racial characteristics, such as rate of growth, form and color of needles, form of tree, form of cone, and susceptibility to disease, are transmitted at least to the 2nd and 3rd generations even when grown under identical conditions. Average weights and heights of seedlings from different lots of seed are given. It was also demonstrated that up to at least 58 years, trees of foreign origin had not become sufficiently acclimated to produce seed suitable for domestic use, even when exposed to cross fertilization by pollen of native pines. It is concluded that seed of the ill-adapted races should not be used, and that existing plantations of these races should be destroyed before they reproduce naturally or cross-fertilize the seed of domestic pines.—*W. N. Sparhawk.*

7646. Murray, S. S. (compiler). **A handbook of Nyasaland.** *314 p.*, (Section on Forestry, *p. 188–197*). *illus., 1 map.* Crown Agents for the Colonies: London, 1922.—Throughout the uninhabited parts of the Protectorate there still exist large tracts of natural forest composed chiefly of small broad-leaved trees and scrub of little commercial value except as poles and fuel. Valuable timber-yielding trees of fairly large dimensions are confined chiefly to damp ravines on mountain and hill slopes and to banks of streams on the plains. The only tracts of heavy timber forest are the small patches of Mlanje cypress (*Widdringtonia Whytei*) which are confined to valleys and ravines on the higher slopes and plateaus of the Mlanje mountain (a little over 2,000 acres). Other valuable trees are listed, and the planting of eucalypts and other exotic species is discussed.—*W. N. Sparhawk.*

7647. Новопокровский, N. B. [Novopokrovski, I. V.] **Краткий отчет о дѣятельности Новочеркасскаго Отдѣленія Русскаго Ботаническаго Общества по организаціи на Дону степных Заповѣдников.** [**A brief note on the activity of the Novocherkassk section of the Russian botanical society for the organization of forest reserves on the Don Steppes.**] Журнал Новочеркасскаго Отдѣленія Русскаго Ботаническаго Общества [Jour. Novocherkassk Sect. Russian Bot. Soc.] **1:** 12–18. 1919.

7648. Ramana Rao, P. V. **Notes on the germination of teak seed in the course of one month.** Indian Forest. **50:** 259–260. 1924.

7649. Record, S. J. **The making of a violin.** Amer. Forests and Forest Life **30:** 17–19, 54, 60. *10 fig.* 1924.

7650. Rhumbler, L. [Rev. of: Escherich, K. **Die Forstinsekten Mitteleuropas.** (**Forest insects of central Europe.**) (Revision of Judeich-Nitsche, **Lehrbuch der mitteleuropäischen Forstinsektenkunde.**) Band II. *675 p. 335 fig.* Paul Parey: Berlin, 1923.] Forstwiss. Centralbl. **46:** 220–224. 1924.—This work is exceedingly thorough, clear, and accurate. It is much better arranged than the original edition published some 30 years ago, is excellently illustrated, contains complete lists of references, and covers twice as much ground. [See also Bot. Absts. 13, Entry 4937.]—*W. N. Sparhawk.*

7651. Roberts, S. G. **The paper of the future.** Sci. Amer. **129:** 82–83. *5 fig.* 1923.—This deals with the possibility of making all kinds of paper from southern yellow pine stumps.—*Chas. H. Otis.*

7652. Roldan, Angel. **Cedro blanco.** [**Cupressus thurifera.**] México Forest. **2**[13–14]: 11–44. *4 fig.* 1924.—This tree of the cool and temperate region of Central Mexico is valued both for ornamental planting and for timber.—*W. N. Sparhawk.*

7653. Rubner, Konrad. **Über die forstlichen Verhältnisse Südfinnlands.** [**Forest conditions of southern Finland.**] Forstwiss. Centralbl. **46:** 111–121, 200–211. 1924.—Southern Finland is characterized by diluvial soils, extensive moors and swamps, a short growing season (4 months over 10°C. near the coast, 3 months inland) with frequent late and early frosts, and a precipitation of about 500–600 mm. including fairly deep snow lasting until May; hence the soil moisture is adequate and injurious droughts rarely occur. The principal trees are pine (3 races of *Pinus silvestris*), 55.6% by area; spruce (*Picea excelsa*), 24.6%; birch (*Betula odorata* and *B. verrucosa*), 14.9%; and gray alder (*Alnus incana*), 2.9%. Of exotics, Siberian and European larches give high yields, Siberian fir is of doubtful value, while beech and European

fir cannot endure the severe spring frosts. Certain other exotics show considerable promise.—Virgin forest is practically nonexistent, few stands exceeding 120 years in age. The whole country has been burned over within approximately a century for purposes of cultivation (Waldbrandwirtschaft). Where burning was repeated every 20–35 years alder and pine predominate, with considerable birch, and the stands are of poor quality. On better or moister soils spruce appears. A large proportion of the stands are even-aged and practically all are of natural origin. The small private owners do not practice silviculture, but merely cull the desired trees from their forests, leaving reproduction to chance. On the State forests more systematic methods are attempted, using either selection or shelterwood cutting with natural reproduction, which is usually satisfactory. Cajander's correlation of site-quality with shrub and herbaceous vegetation checks with actual field conditions for closed, approximately mature stands. Of the large areas of swamp and moor, probably ⅓ can be drained and afforested.—*W. N. Sparhawk.*

7654. Schmidt. **Weiteres über die Douglasie.** [More about the Douglas fir.] Deutsch. Forstzeitg. 39: 559–560. 1924.—From 10.8 hectolitres of cones collected in December and and January, 4 kgm. of seed were obtained, and 3 kgm. of the seed produced 18,900 plants.—*W. N. Sparhawk.*

7655. Schupfer. [Rev. of: Biolley, H. E. **Die Forsteinrichtung auf der Grundlage der Erfahrung und insbesondere das Kontrollverfahren.** (Forest regulation and the "method of control.")] (Original French ed. published in Paris and Neuchatel, 1921. Translated into German and published by Eberbach.).] Forstwiss. Centralbl. 46: 156–161. 1924.—Biolley's ideal, the selection forest, has many advantages, but systems of management must vary with site and economic conditions. His method calls for very intensive forestry, with small administrative units. It is doubtful whether enough long, clear logs would be produced if the selection method were adopted for all forests. A feature of the "control method" worth adopting in connection with other silvicultural systems is the frequent stock-taking and reckoning of increment.—*W. N. Sparhawk.*

7656. Schwappach. **Veränderung im forstlichen Unterricht des Auslandes.** [Changes in forestry education abroad.] Deutsch. Forstzeitg. 39: 488–489. 1924.—This is a brief discussion of the institutions now offering instruction in forestry in the following countries: Austria, Hungary, Czechoslovakia, Poland, Jugoslavia, Rumania, Russia, Japan, and U. S. A. The old Forest Institute at Petrograd (Leningrad) has reopened with over 1,000 students. Development of forestry education in Japan and the U. S. A. is especially striking. Japan has gone much farther than the U. S. A. in providing elementary and intermediate training.—*W. N. Sparhawk.*

7657. Seaman, L. N. **Note on the strength, treatment, and durability of sain (Terminalia tomentosa) sleepers.** Indian Forest. 50: 298–314. 1924.—This wood is superior to *Quercus alba* for railroad ties. To avoid splitting, small holes should be bored for the spikes. Redriven spikes hold as well as those freshly driven. Creosote penetrates well under pressure. Untreated ties last 5–7 years; treated ties, 12–17 years, or longer.—*E. N. Munns.*

7658. Seitner, M. **Zwei neue Phloeophthorus-Arten aus der Herzegowina.** [Two new species of Phloeophthorus in Herzegowina.] Centralbl. Gesam. Forstw. 46: 282–286. 1920.—Both beetles attack *Cytisus Weldenii*, a shrub which is important as goat browse in southern Dalmatia. The foliage is browsed in summer and the bark is eaten in winter, the bark wounds healing over the following summer. The insects bore into the shoots above the bark wounds and by repeated attacks kill the shrub. While the life history of these insects is not fully known, cutting and burning the infested shoots is recommended as a control measure.—*R. H. Weidman.*

7659. Spitzenberg. **Die Wühlkultur.** [Cultivation by stirring and loosening the soil.] Deutsch. Forstzeitg. 39: 509–515, 533–538. *14 fig.* 1924.—It is asserted that proper working of the soil before sowing or planting will result in 30% increase in yield of pine forests. Implements for this and other operations connected with reforestation work are described and illustrated.—*W. N. Sparhawk.*

7660. Staudacher. **Die Frostschäden im Forstbetrieb, deren Ursachen und Bekämpfung.** [Frost damage and forestry.] Forstwiss. Centralbl. 46: 1–13, 54–66, 98–111. *12 fig.* 1924.—There are 2 classes of frosts, those caused by cold winds, and those caused by rapid evaporation

and radiation when the air is still. Of the latter class are "grass frosts," resulting from rapid evaporation with temperature near freezing and a rising barometer, and "mulden" frosts, caused by the accumulation of cold air flowing into pockets and depressions without outlets. Grass frosts seldom extend above the grass-tops, and are especially injurious to young plantations, which often remain stunted until a frostless growing season enables them to grow above the danger zone. Damage from such frosts increases with size of grassy area, with height of the grass, and with the degree of packing of the soil. Frost pockets may be due to topography or to dense stands surrounding an opening so as to prevent air drainage. Frost damage in such pockets varies in height with the size of the "air-shed" draining into them and with the intensity of the cold. Wet soil does not increase frost danger, but for topographic reasons is common in frost pockets.—Frost damage can be avoided to a large extent by silvicultural measures: Avoid clear cutting, or clear only narrow strips, usually no wider than will be protected by the neighboring stand; delay cutting the adjoining strip until young growth is above the frost danger line; keep down rank grass by early cultivation and reforestation, by growing agricultural crops between the young trees, or by direct removal of the grass; plant at first a nurse-stand of frost-hardy species; develop strains which commence growth late in the spring for planting on areas subject to frost; facilitate air drainage by pruning or thinning the edges of stands which dam up the cold air; drain wet depressions where practicable; never enlarge openings in frost pockets, but gradually reforest existing openings with frost-hardy species or with other species introduced under shelter. It may often be desirable to organize the areas subject to frost as distinct compartments or units of management.—*W. N. Sparhawk.*

7661. Tschermak, L. **Kahlfläche und Blendersaumschlag, vergleichende Bodenuntersuchungen.** [Soil investigations under conditions of clear cutting and shelterwood cutting.] Centralbl. Gesam. Forstw. **46**: 317–335. 1920.—During the growing season, the water content of the upper 1–2 cm. of soil was considerably less on clear cut areas than on shelterwood strips. It was also a trifle less under the original crown canopy than under shelterwood. It is concluded that the soil water of the surface layers, so essential for the establishment of seedlings, is conserved far better in all systems of partial breaking of the canopy (including the Dauerwald) than in clear cutting. The humus content of the upper layers was considerably higher under shelterwood or selection cutting than on clear cut areas. Thus, soil under shelterwood is more permeable. The green weight of forest weeds was considerably greater in the open than under shelterwood.—*R. H. Weidman.*

7662. United States Dept. Agric., Forest Service. **Forest fires in the Intermountain region.** U. S. Dept. Agric. Misc. Circ. 19. *1–16. 11 fig.* 1924.—During the period 1909–1923 fires burned over 606,279 acres and destroyed 600,000,000 board feet of timber as well as other values. More than ½ of the whole number were caused by human carelessness, the remainder by lightning, which is most serious in western Idaho.—*W. N. Sparhawk.*

7663. United States Dept. Agric., Forest Service. **Importance of forestry and the national forests.** U. S. Dept. Agric. Mis. Circ. 15. *1–16. 10 fig.* 1924.—This is a brief popular outline of the country's forest situation and the role of the national forests, prepared for the use of social and civic organizations in Arizona and New Mexico.—*W. N. Sparhawk.*

7664. Unwin, A. Harold. **West African forests and forestry.** *8vo., 527 p., 110 fig.* T. Fisher Unwin Ltd.: London, 1920.—The forests of Gambia, Sierra Leone, Liberia, Ivory Coast, Gold Coast, Togo, and Nigeria are described briefly with particular attention to their extent and timber potentialities. Considerable space is devoted to descriptions and vernacular names of tree species with special reference to features of structure by which they may be recognized by observers possessing little or no botanical training. The value of these trees for local use and for export is discussed and considerable information is given regarding forest exports and the rules and regulations under which timber may be cut and exported. In addition to the discussion of forests and timber there are chapters on oil beans, seeds and nuts; oil palm and the palm kernel industry; the forest in relation to agriculture; and a bibliography of West African forests. The illustrations are from photographs of forests and individual trees. [See also Bot. Absts. 11, Entry 184; 13, Entry 6948.]—*Geo. D. Fuller.*

7665. Versluys, W. **Acacia villosa Willd. als plaatsvervanger voor Leucana glauca Bth.** [Acacia villosa as a substitute for Leucaena glauca.] (With English summary.) Tectona 15: 235–240. 1922.—*Leucaena glauca* is in some places unsuited for interplanting in teak plantations, as it grows too fast and suppresses the teak. *Acacia villosa*, a shrub from Curaçao, which grows on dry calcareous soils and is easily propagated by seed, gives promise of being a good substitute.—*Carl Hartley.*

7666. Weber, Heinrich Wilhelm. **Der Dauerwaldgedanke Möllers.** [Möller's "Dauerwald" doctrine.] Forstwiss. Centralbl. 46: 13–25. 1924.—The Dauerwald (continuous forest) idea which has recently found favor with German foresters is based on an erroneous conception of the purpose of forest management, which is to utilize the forest for satisfying private and social economic needs rather than slavishly to follow guidance of unrestricted nature.—*W. N. Sparhawk.*

7667. Wise, L. E. **Wonder burners of wood.** Amer. Forests and Forest Life 30: 3–6. *6 fig.* 1924.—This is a popular article on the old and new methods of charcoal burning, with an enumeration of the by-products obtained in present-day practice, and their many uses.—*Chas. H. Otis.*

7668. Wolff, Max. **Die Massenvermehrung der Forleule.** [The pine moth epidemic.] Deutsch. Forstzeitg. 39: 659–662. 1924.—As epidemics of *Noctua piniperda* (*Panolis flammea* Schiff.) have occurred at intervals since 1725, it is evidently erroneous to attribute them to modern silvicultural methods, particularly to the extensive culture of pine in pure stands. The spread of the moths appears to be due rather to a succession of dry summers, perhaps accompanied by severe winters. The widespread idea that infested stands are doomed and must be clear cut immediately in order to save the timber, is not confirmed by the results of previous infestations. Entire stands are rarely killed; this occurs only where soil and climatic conditions are unfavorable and the defoliation is repeated. Usually only unhealthy, suppressed, or fire-weakened trees die after 1 defoliation. The severe infestation of the present year in northern Germany is apparently at an end, the caterpillars having been destroyed by a fungous disease and by parasitic insects. There is serious danger that mistaken public opinion will force extensive clear cutting of defoliated stands, thus reducing timber prices and forest revenues, while at the same time making necessary heavy expenditures for artificial reforestation.—*W. N. Sparhawk.*

7669. Zederbauer, E. **Ein Beitrag zur Kenntnis des Wurzelwachstums der Fichte.** Development of the root system of spruce.] Centralbl. Gesam. Forstw. 46: 336–337. 1920.—Plantations of 4-year old stock (*Picea excelsa*) in heavy clay soil showed the following results after 25 years: The ratio in weight of the underground to the above-ground parts remained practically the same for different spacings. So close a spacing as 0.5 × 0.5 m. maintained until the 15th year induced very irregular development of lateral roots. This effect was not entirely overcome by subsequent heavy liberations. To develop a well-balanced and wind-firm root system during the establishment period of spruce (the 1st 20 years), it is necessary to use spacing as wide as 1 × 1 m. or even 2 × 2 m. These distances must be kept in ratio as the trees increase in size.—*R. H. Weidman.*

7670. Zw. **Eine wertvolle Nebenholzart.** [A valuable subordinate species.] Deutsch. Forstzeitg. 39: 500. 1924.—*Sorbus torminalis* is highly esteemed for making certain parts of machinery and deserves consideration by foresters as a subordinate element of the stand. It thrives on rocky slopes, on basalt and limestone soils.—*W. N. Sparhawk.*

GENETICS

Orland E. White, *Editor*

(See also in this issue Entries 7538, 7545, 7549, 7573, 7762, 7767, 7770 7771, 7841, 7845, 7851, 7852, 7864, 7880, 7885, 7891, 7911, 7973, 7977, 8098)

7671. Anonymous. [Rev. of: Dürken, Richard. **Allgemeine Abstammunglehre, zugleich eine gemeinverständliche Kritik des Darwinismus und des Lamarckismus.** (General theory of descent, a popular critique of Darwinism and Lamarckism.) *205 p., 38 fig.*

Gebrüder Borntraeger: Berlin, 1923 (See also Bot. Absts. 13, Entry 5831).] Amer. Jour. Public Health 14: 531. 1924.

7672. Allan, H. H. **On the hybridity of Coprosma cunninghamii Hook. F.** New Zealand Jour. Sci. & Tech. 6: 310–318. *2 fig.* 1924.—*Coprosma cunninghamii*, a bushy shrub or small tree native of New Zealand, is thought to be a natural hybrid between *C. propinqua* and *C. robusta*. Growth form is intermediate. Leaves, inflorescences, and fruits indicate an intermediate condition between the 2 parental types. There are many gradations. The author considers *C. cunninghamii* as the middle numbers in a series of "intermediate" hybrids of which the extremes are regarded as "variable" forms of the parents.—*J. Ben Hill.*

7673. d'Angremond, A. **De Y_{10}, E_1 en de Dwergboom × Kanari-hybride onderling vergeleken.** (**A comparison of the varieties Y_{10}, E_1, and the cross Dwarf × Canary-hybrid.**) Mededeel. Proefsta. Vorstenland. Tabak 33: 69–85. 1918.—Especially to determine the comparative merits for general culture of the 2 types of tobacco, E_1 and the cross Dwarf × Canary-hybrid, a careful analytical field study was made, using the variety Y_{10} as a standard of comparison, although the Canary would have served equally as well for this purpose. The E_1 is characterized by superior burning quality even on soils unfavorable to good burn, and is very prolific, affording, however, a product of only fair quality. On the other hand, the Dwarf × Canary-hybrid has a rather poor burning quality, but is highly resistant to wind damage and produces a product of high quality.—As a result of this comparative study of the yields, quality, etc., the following deductions have been made which apply, however, only to the particular season and soil conditions in which the experiments were undertaken. The yields of the 3 types have differed so slightly that their differences have no particular significance since they are within the range of experimental error. With respect to wind damage, the 3 types showed marked differences, the E_1 being much more susceptible and the Dwarf × Canary-hybrid much less susceptible to wind injury than the Y_{10}. This factor in itself may have influenced the yields per unit area, making it apparently larger for the Dwarf × Canary-hybrid and smaller for the E_1. The Dwarf × Canary-hybrid has a shorter leaf than the Y_{10} or the E_1 and produces a considerably larger percentage of "aloes" (leaves of fine, smooth, glossy texture) than the Y_{10}. On the other hand, the E_1 is characterized by an almost total lack of "aloes," yielding a large percentage of "Kassar" (leaves of dull, coarse, rough texture).—*H. A. Allard.*

7674. d'Angremond, A. **Eenige Aanwijzingen over het kunstmatig kruisbestuiven bij tabak.** (**Instructions with respect to the artificial cross-pollination of tobacco.**) Mededeel. Proefsta. Vorsteuland. Tabak 33: 89–95. 1918.—An outline of the necessary preparations and instruments needed to facilitate careful hand pollination is given. The 1st step consists in setting up a bamboo frame work for the support of the cheese cloth nets which are to enclose the flower heads after the removal of all open blossoms and young capsules. First, the flowers just ready to open on the selected parent plants are collected, and the anthers removed and spread out in suitable dishes to collect the pollen. On the 2nd and following days this pollen is placed in glass tubes. All blossoms with open anthers are now removed from the mother plants. Emasculation of selected blossoms, followed by pollination of the pistils, is the next step. The cheese cloth nets are now closed. These should be of large diameter to prevent the leaving off of too many young seed capsules. The pollen is readily transferred by a water color brush furnished at the end of the shaft with a pin which can be used to split open the corolla. String made of suitable material may be used to label the pollinated blossoms.—*H. A. Allard.*

7675. Baashuus-Jessen, J. **Some remarks on the principles in inbreeding.** Hereditas 5: 231–240. 1924.—Inbreeding of the brother and sister type, while theoretically an effective method of producing homozygosity, is not practical in livestock breeding. Especially is this true in cooperative breeding where a number of small herds are served by a single ♂. The mating of homozygotic ("prepotent") individuals, which occasionally appear, with their own offspring is believed by the author to be more practical and at the same time more effective in producing fixity of type. Pedigrees of a number of animals are given as evidence. —*P. C. Mangelsdorf.*

7676. Babcock, E. B. **Species hybrids in Crepis and their bearing on evolution.** Amer. Nat. 58: 296–310. 1924.—The experimental method is important in attacking problems of evolution. New types may originate either through mutation or hybridization. Mutations are of 2 general categories—point mutations and chromosome aberrations. Point mutations produce new varieties within a species and might in time produce distinct new species having the same chromosome number. It is only by chromosome aberrations that a new species with a different chromosome number might arise from a single pre-existing species. Lotsy has championed the theory that all new species originate through hybridization between old species. Our work shows that species originate both by mutation and by hybridization.—Crepis investigations were begun in 1915 to test the chromosome theory of heredity and have gradually expanded along 3 lines: (1) Genetic analysis of *Crepis capillaris*, *C. setosa*, and other species with low chromosome numbers. (2) Taxonomic and cytologic study of many species of *Crepis*. (3) Experiments with species hybrids.—*Crepis*, which is closely related to *Hieracium*, is a large genus at present comprising 11 subgenera. Among the species with known chromosome numbers, the following series of diploid numbers occur: 6, 8, 10, 12, 16, 18, 40. Such a series is unusual in a single genus and raises the question as to the naturalness of grouping of the present species of *Crepis*. Three species hybrids are briefly discussed: *C. capillaris* (n = 3) × *C. tectorum* (n = 4); *C. setosa* (n = 4) × *C. capillaris* (n = 3); *C. setosa* (n = 4) × *C. biennis* (n = 20). In the 2nd and 3rd crosses mentioned above, at time of reduction division in F_1 hybrid the 2 n-groups behave very differently. In *C. setosa* × *C. capillaris* the 7 non-homologous chromosomes fail to pair and go at random to the poles. In *C. setosa* × *C. biennis* the *biennis* chromosomes form 10 pairs which segregate, while the *C. setosa* chromosomes go at random. This with other evidence shows that *C. biennis* is at least tetraploid, probably octaploid. As the result of chromosome combinations possible from self-fertilizing of these F_1 hybrids, striking new types have been secured; some of these have even numbers of chromosomes, and should breed true and in time be recognized as new species.—*Crepis capillaris* has been analyzed sufficiently to show that point mutations cause polymorphism within a plant species. Evidence from the *C. biennis* hybrid shows that species with an increased number of chromosomes may originate through irregularities in mechanism of chromosome distribution. Forms derived from interspecific hybrids indicate that new species with different chromosome numbers may originate by crossing of old species. Hence, evidence supports both mutationist's and hybridist's conceptions of the method of evolution.—*Author.*

7677. Babcock, E. B., J. L. Collins and M. Mann. **Progress in Crepis investigation.** Studia Mendeliana. *P. 5–8.* Typos: Brunn, Czechoslovakia, 1923.—An account is given of progress in cytological and genetic studies of *Crepis*. Genetic analysis of variation in several species having low chromosome numbers is in progress—particularly in *C. capillaris* with n = 3. A number of inter-specific hybrids have been secured: viz., *C. setosa*, × *C. capillaris*, *C. setosa* × *C. biennis*, and *C. capillaris* × *C. tectorum*. The last does not mature. Cytological studies of F_1 *C. setosa-capillaris* hybrids disclose an irregular distribution of the 4 chromosomes of *C. setosa* and of the 3 of *C. capillaris* without pairing. In F_1 *C. setosa-biennis* hybrids the 20 chromosomes from *C. biennis* form 10 pairs and the 4 *C. setosa* chromosomes remain unpaired. Determinations of chromosome number of many species fails to disclose any consistent relation between chromosome number and taxonomic systems, although certain suggestions for revision of taxonomic groupings are made on the basis of cytological and genetic evidence. Cytological criteria have been used in establishing identity of certain material received under different names.—*R. E. Clausen.*

7678. Baroulina, E. I. **К вопросу о перезимовке озимен.** [The resistance of winter cereals to winter cold.] (English resumé.) Изв. Саратов. сел.—хоз. Инст. [Ann Inst. Agron. Saratov.] 1: 42–57. 1923.—It was previously shown by Kolkunow that high osmotic pressure (O.P.) of cell sap was correlated with cold resistance, and length of stomates with both cold and drought resistance. Stebut had observed that spreading autumn varieties were more winter resistant than non-stooling erect types. The author tested a large number of wheat types from different sources to determine to what extent these characters could be used in breeding for cold resistance. Although in a general way a definite positive

correlation was found in many instances between high O.P. and cold and drought resistance, varieties having about the same O.P. behaved differently as to cold resistance. Rye is cited as being more cold resistant than wheat in spite of its lower O.P. Some drought resistant varieties were susceptible to winter cold. The average length of stomates was greater among frost resistant varieties, but this relation was not definite. The degree of stooling of autumn varieties was not correlated with cold resistance. The author believes that a single character cannot be used as a criterion for selection of winter resistant strains.—*S. Boshnakian.*

7679. Bauer, K. H. **Über der Erbbiologie der Hämophilie und deren Bedeutung für unsere Vorstellungen von der Natur der Gene.** [Biology of haemophilia inheritance and its significance for the concept of the nature of genes.] Zeitschr. Indukt. Abstamm.- u. Vererb. 30: 314–316. 1923.—The gene for haemophilia is regarded as lethal to explain the absence of haemophilia in females. In carriers, the lethal factor is covered by the normal allelomorph. In males the X chromosome does not prevent the manifestation of the lethal factor. Haemophilia is due to the absence of sufficient thrombokinase. Full discussion is given in Zeitschr. Chir. 176.—*Helen D. Hill.*

7680. Baur, E. **Aufgaben und Ziele der Vererbungswissenschaft in Theorie und Praxis.** [Problems and aims of genetics in theory and practice.] Zeitschr. Indukt. Abstamm.- u. Vererb. 30: 274–277. 1923.—This is a general discussion. The application of mendelian laws could increase cereal yields 30–40%.—*Helen D. Hill.*

7681. Baur, E. **Die Factorenkoppelung bei Antirrhinum im Lichte der morganschen Theorie.** [Factor linkage in Antirrhinum in the light of Morgan's theory.] Zeitschr. Indukt. Abstamm.- u. Vererb. 30: 289. 1923.—Four linkage groups have been found. Evidence is incomplete as to agreement with the Morgan interpretation of linkage. This is published at greater length in Bibliotheca Genetica 4.—*Helen D. Hill.*

7682. Becker, Josef. **Die Gemüsesaat-Anerkennung, eine Lebensnotwendigkeit der deutschen Gärtnerei.** [Vegetable seed recognition is of prime importance to German horticulture.] Gartenwelt 27: 62, 78–79, 101–102. 1923.—The use of the best and most productive strains is of great importance. It is pointed out in detail that the grower should receive seed which breed true to type in order that unpleasant consequences will be avoided. The isolation of the seed fields is considered, especially as regards cabbage varieties and species of Brassica.—*J. C. Th. Uphof.*

7683. Becker, Joseph. **Ein Beitrag zur Züchtung der Pfirsiche.** [A contribution to peach breeding.] Gartenwelt 27: 274–275, 285–286. 1923.—Nectarines are found (1) among seedlings of peaches and (2) as bud variations. Nectarine × peach give peaches; nectarine × nectarine give nectarine, thus wooliness is dominant; smoothness, recessive. A few peach varieties are almost homozygous. The variety Samenechte von Proskau is generally, but not entirely constant. More or less true breeding varieties are Grosse Mignon, Weisse Magdalene, Königin der Obstgarten, Kernechter vom Vorgebirge, and Kernechte von Wassenberg. We need at least 4 or 5 varieties from seed-constant peach forms—1 ripening toward the end of July, others for the beginning and end of August, and 1 for September. It is important in peach breeding to have early varieties. Very early varieties are Früheste von Alten (Sneed) and Sieger (Vainqueur), although both are susceptible to leaf curl (*Exoascus deformans*). Early peaches should be hybridized with good, late, free-stone peaches. In hybridizing, early varieties should not be used as mother plants, as they do not produce fully developed seed. An excellent early peach which should be considered in breeding is Königin Karola von Sachsen. The importance of susceptibility to disease is emphasized. Varieties very susceptible to peach leaf curl are: Sieger, Früheste von Allen, Triumph, Early Rivers, and Grosse Mignon. Less susceptible varieties are: Rote Magdalene, Early Alexander, Amsden, and Perle von Muffendorf. Resistant varieties are: Eiserner Kanzler, Proskauer, Präsident Griepenkerl, Waterloo, Early York, Regh's Liebling, Hale's Early, and Kernechter vom Vorgebirge. For hybridizing, young trees which have not formed too many flowers should be preferred. Pollination, seed treatment, sowing, and planting are discussed.—*J. C. Th. Uphof.*

7684. Benedict, R. C. **Variations in the dagger fern.** Amer. Fern Jour. 13: 124–126. 1923.—This paper reports briefly observations on about 400 plants of *Polystichum acrostichoides.*

The plants were examined to determine types of leaf variation with a view to getting data for comparison with the variation of *Nephrolepis exaltata bostoniensis* which has a similar leaf type. Six per cent of the total were classed as samples of the crispate type, less than 1% showed cresting or forking of the pinnae, 1% were noted as distinctly larger than the average. No dwarfed nor twice pinnate forms were seen.—*R. C. Benedict.*

7685. Bertrand, Gabriel, et B. Benzon. **Sur une sorte de mutation physiologique observee chez la souris. [A kind of physiological mutation observed in the mouse.]** Compt. Rend. Acad. Sci. Paris **177**: 297–299. 1923.—One mouse lived for 11 weeks on a vitamine-free diet that killed others in 5 weeks. The authors think the exceptional mouse may be a physiological mutation.—*E. C. MacDowell.*

7686. Bluhm, A. **Weitere Versuche zur Verschiebung des Geschlechtsverhältnisses bei Saugetieren. [Further experiments in disturbing sex ratios in mammals.]** Zeitschr. Indukt. Abstamm.- u. Vererb. **30**: 307–308. 1923.—The treatment of white mice with alcohol raised the percentage of males. The treatment of males with yohimbine raised the percentage of males and was without effect on the females. Treatment with caffeine is discussed. The results are believed to support the idea of heterogametism among males in mammals.—*Helen D. Hill.*

7687. Bonnevie, K. **Zur Frage der Vererbung der Papillarzeichnung. [Inheritance of finger print patterns.]** Zeitschr. Indukt. Abstamm.- u. Vererb. **30**: 313–314. 1923.—There are characteristic differences between races. All races show a high degree of whirled patterns on the 1st and 4th fingers, and bows and radial loops show striking maxima on the 2nd fingers. Fingerprint patterns are determined genotypically. More studies are necessary to establish dominance, etc.—*Helen D. Hill.*

7688. Bonnier, G. **Über die Realisierung verschiedener Geschlechtsverhältnisse bei Drosophila melanogaster. [The realization of various sex ratios in Drosophila melanogaster.]** Zeitschr. Indukt. Abstamm.- u. Vererb. **30**: 283–284. 1923.—Actual 2.21 : 1 ratio was found in an experiment in which females had 2 lethals separated by 8.9 units in the same chromosomes. If females carry lethal in each of the 2 sex chromosomes, all male zygotes except crossovers die. When there were XXY females with lethal in each X chromosome, the author secured a ratio 1014♀ : 129♂. Females do not die because they cannot be secured homozygous. A new sex-linked lethal arose by mutation and killed the homozygous females.—*Helen D. Hill.*

7689. Brecher, L. **Lichtbeeinflusste Schmetterlingspuppen und der Nachkommen. [Butterfly pupae affected by light and their progeny.]** Zeitschr. Indukt. Abstamm.- u. Vererb **30**: 291–293. 1923.—The experimenter confirmed Dürken's results, finding that positive effects of color modification induced by light changes were carried over from parents to offspring when the latter were kept in the dark.—*Helen D. Hill.*

7690. Brožek, Artur. **A case of nonmendelian inheritance of the white striped races (formae albomaculatae) of the Mimulus quinquevulnerus.** (Abstract of paper before 1st. Congress Czechoslovak botanists, Prague.) Věstnik Sjezdu Ceskoslovenských Boy. Praze. **1**: 40–42. 1923.—White striped or so-called "albomaculate" plants were seen among entirely green families as very rare mutations, occurring in 8% of a *M. quinquevulnerus rubinus* family and in 7% of a *M. quinquevulnerus speciosus* family. In the latter case different degrees of variegation were reported. The percentage of the green plants and that of variegated plants in various degrees, and the percentage of white plants accorded with the degree of the albomaculation of the calyx of the blossom, which had been self-fertilized, and not in accordance with the degree of the albomaculation of the whole mother plant.—A cross between a wholly green *rubinus* plant used as the ♀ parent and an albomaculate *speciosus* plant as the ♂ parent, gave in F_1 and F_2 only entirely green plants. Another cross was made using an albomaculate *speciosus* plant as the ♀ parent and a green luteus-tigrinus as the ♂ parent. The F_1 generation was composed of 3 types of plants—white, wholly green, and variegated in different degrees. The F_2 generation was white, wholly green, or variegated according to whether the calyx of the F_1 blossom was white, green or variegated. A reciprocal of the above showed noninheritance through the ♂ parent.—The experiments prove that the inheritance of this albomaculate type is maternal.—*W. A. Carver.*

7691. Brožek, A. **Hauptresultate der Kreuzungsexperimente mit Mimulus. [Chief results of crossing in Mimulus.]** Zeitschr. Indukt. Abstamm.- u. Vererb. **30**: 319–323. 1923.—*M. quinquevulnerus rubinus*, *M. tigrinus variegatus*, and *M. tigrinoides* were used as parents of pure lines, which were crossed. Varieties *M. quinquevulnerus rubinus* and *M. speciosus* crossed. The F_2 produced phenotypes of the 2 in a 3 : 1 ratio. Reciprocals between *M. tigrinus luteus* and *M. tigrinus variegatus* produced intermediate hybrids. *M. quinquevulnerus rubinus* and *M. tigrinus luteus* crossing resulted in the conclusion that the spotting of petals is conditioned by 2 or at most 3 factor pairs. Experiments with full and simple blossoms indicate the presence of 2 factors of which 1 suffices to suppress the full blossom. Pelory was found to be the dominant character. Variegation is dependent on the female parent and is never carried by the pollen.—*Helen D. Hill.*

7692. Bruyker, O. de. **Bastaarden van Viola tricolor en vegetative bastaardsplitsing. [Hybrids of Viola tricolor and vegetative hybrid segregation.]** Natuurwetenschapp. Tijdschr. **5**: 174–179. *3 fig.* 1923.—The pansies for this experiment were derived from a neglected garden where some years previously large flowering pansies had been grown. They increased freely and developed 3 probably atavistic forms with small flowers, which the writer called A, B, and C. They are much taller than broad and have narrow petals. In A, the upper petals and also the periphery of the lower ones are purple, the central part of the latter is yellow with violet stripes. B is white-yellow, resembling *Viola tricolor arvensis* in color, but it is much larger. C occurred less frequently and stands between A and B; the upper petals are purple as in A and the others are like those of B. When self pollinated, the progeny of A and B were like the parents, while C behaved as a monohybrid. Some differences occur in the C types, which are considered of importance in factor analysis. Certain flowers showed on the lower petal a small, violet colored tip, called C_w. Both kinds of flowers may occur on the same plants, as is also true for their progeny. On well nourished plants this violet colored spot is always absent, while on those in poor soil it may be present. Modifications of the flowers of B are mentioned as also being influenced by environment; and examples are given of sectorial loss mutations in this form. The writer believes that most bud variations are vegetative hybrid segregations.—*J. C. Th. Uphof.*

7693. Castle, W. E. **Does the inheritance of differences in general size depend upon general or special size-factors?** Proc. Nat. Acad. Sci. [U. S. A.] **10**: 19–22. 1924.—This is a discussion of criticisms made by Sumner. In concluding that factors for size in mammals are exclusively general in their action, the author was speaking of the size of the animal as a whole and not of any detail. The brachydactyl mutation in man, and in rodents the size characters of ears, tail and hair, may be controlled by independent genes, but these have no probable effect on the general body size. In rabbits there is no evidence "of anything more than *somatic* variations in the parts of the body independently of general body size."—*E. C. MacDowell.*

7694. Castle, W. E., and W. L. Wachter. **Variations of linkage in rats and mice.** Genetics **9**: 1–12. 1924.—In rats, crossovers in the chromosome carrying the genes for albinism, pink-eyed yellow and red-eyed yellow occur more frequently in females than in males. The crossover percentages of the 2 sexes taken separately indicate the tenability of the linear arrangement theory. Age, size of litter, and temperature do not influence the percentage of crossovers. Selection of extreme individuals has no racial effect on the crossing over. Variation in percentages given by individuals is due to random sampling.—*E. C. MacDowell.*

7695. Cavara, Fridiano. **Di un ibrido del lauro-canfora (Cinnamomum camphora Eber. et Nees × C. glanduliferum (Wall) Meissn.). [A hybrid of camphor and laurel (Cinnamomum camphora Eber. et Nees. × C. glanduliferum (Wall) Meissn.).]** Bull. Orto. Bot. Napoli **7**: 31–34. *1 pl.* 1924.—The author was inspired by a suggestion of this cross in work of Giglioli. The context indicates but fails to establish definitely that the cross was made. Seed of the (assumed) cross yielded plants apparently intermediate—at least in respect to the camphorous ŏdor. From a practical standpoint the ability to secure from them not solid camphor but only essential oils was stressed. The plants resembled those grown from laurel-camphor seed secured from Japan.—*Helen D. Hill.*

7696. Chapman, Frank M. **Mutation among birds of the genus Buarremon.** Bull. Amer. Mus. Nat. Hist. 48. *35 p., 4 pl.* 1923.—While expressing his belief in "the profound influence exerted by observable environmental factors (chiefly climatic)" in the evolution of species, the author presents evidence designed to prove that new forms may arise through the appearance of individual variations or mutations in color and in pattern of marking, isolation being essential to the perpetuation of such characters.—Stereotyped markings, like superciliary lines, wing-bars and breast-bands, common to many unrelated birds, are considered mutational characters. This paper deals chiefly with the last, their presence or absence distinguishing several species of the genus *Buarremon* otherwise nearly alike.—*Author.*

7697. Cooke, W. W. **Cross-pollination experiments with prunes.** Agric. Gaz. New South Wales 35: 368. 1924.—Yields from cross-pollination showed but slight increase over yields from check trees.—*L. R. Waldron.*

7698. Corner, George W. **Oestrus, ovulation and menstruation.** Physiol. Rev. 3: 457–482. 1923.—This is a review, based on more than 80 titles, of the present state of knowledge of cyclic reproductive activity in mammals. General conditions are discussed under the following heads: oestrus, ovulation, implantation, the corpus luteum, function of the corpus luteum, the uterine cycle, and other mechanisms of the cycle. The section on the human cycle correlates observations on primates with other mammals and shows that the trend of recent work points to the periodic discharge of Graafian follicles 10–15 days before the onset of menstruation. This is experimentally supported by the author's work on monkeys, in which he found the first 2 unfertilized primate ova ever seen after discharge from the ovary. Menstruation may be interpreted as the natural result of the failure of the fertilized ovum to utilize the elaborate premenstrual edifice developed in connection with primate placentation. To provide for the opening of the maternal blood vessels into the intervillous spaces, the endometrium becomes so enormously developed, even with bleeding into the tissues, that only the arrival of an embryo with its stimulus to the formation of placenta will inhibit the escape of blood to the exterior.—*E. C. MacDowell.*

7699. Crew, F. A. E. **Studies in intersexuality. I. A peculiar type of development intersexuality in the male of the domesticated mammals.** Proc. Roy. Soc. London 95: 90–109. *12 fig.* 1923.—Intermediate reproductive organs of several pigs and goats are described. The histology of gonads of these was such as might result from various degenerative changes of undifferentiated testes. Intermediate organs in the bull are also described. These abnormal forms can not be free-martins, nor are they females in which more or less complete sex reversal has taken place. In explanation it is suggested that the sex-determining substances are produced in varying amounts during the sexual cycle, and that any organ capable of responding to these substances has different thresholds of response at different stages. Variations in these substances may be due to the absence or to a defect of the interstitial tissue of embryonic tissue or of some other endocrine gland, or to insufficiency of sex-hormone.—*A. Franklin Shull.*

7700. Daniel, Lucien. **Hérédité d'un caractère acquis par greffe chez le topinambour. [Inheritance of an acquired character by grafting, in the Jerusalem artichoke.]** Compt. Acad. Sci. Paris 177: 1449–1452. *Fig. 1–2.* 1923.—The author has long asserted the reciprocal influence of grafted plants as well as the influence on their progeny. In 1921 he grafted the Jerusalem artichoke on an annual sunflower. In 1922 he secured from their seed plants which bore tubercles and which varied in many characters. A table shows irregular inheritance in the bearing of these aerial tubercles. The author believes that his results indicate the origin of new varieties by grafting and that they are a proof of the inheritance of acquired characters, since aerial tubercles in Jerusalem artichoke have never been found except on grafted plants.—*Helen D. Hill.*

7701. Elliot, Clarence. **Hybridization of Berberis.** Gard. Chron. III, 75: 80. 1924. —Reference is made to the fact that seeds of various species of *Berberis* collected in China come true, while seeds of the same species collected in English gardens usually throw a large proportion of hybrids. The author advances the theory that in China, where *Berberis* is indigenous, mutual adaptation has resulted in specialization on the part of insects, a given

insect confining itself to a given species of *Berberis*, whereas in England insects visit *Berberis* promiscuously, with a resulting high percentage of species crosses.—*A. J. Mangelsdorf.*

7702. Emerson, Sterling H. **Do balanced lethals explain the Oenothera problem?** Jour. Washington [D. C.] Acad. Sci. 14: 277–284. 1924.—An examination of recent data used in support of a balanced lethal interpretation of *Oenothera* inheritance (see Bot. Absts. 13, Entry 4284) shows that the data do not conform to the conditions of the hypothesis. The F_1 of the cross *O. lamarckiana* × mut. *rubricalyx* agrees with the hypothesis that *O. lamarckiana* carries 2 balanced zygotic lethals and *O. rubricalyx* only 1, but the F_2 behavior is not explained by that combination of lethals. Other combinations of lethals fit the conditions but little better and are in disagreement with the other known genetic behavior of these forms. The same criticism holds for the cross mut. *rubricalyx* × mut. *funifolia*. In the cross *O. franciscana* hyb. *sulfurea* × mut. *nanella* hyb. *rubricalyx* the factor for sulphur flower color shows 15% crossing over with a gametic lethal assumed to be associated with it; in all other crosses there is no crossing over. No crossover modifier has been identified. In 2 other crosses involving the same genetic races the lethals commonly associated with the plants were disregarded. It is admitted that different plants of the same phenotypic class may differ in their lethal constitutions, but since no tests were made to determine what lethals were present in the plants used, the experiments are not considered as demonstrations of the action of lethals.—*Author.*

7703. Erdmann, Rh. **Explantation und Verwandtschaft. [Transplantation and relationship.]** Zeitschr. Indukt. Abstamm.- u. Vererb. 30: 301–307. 1923.—Transplantation is the most exact measure of the structural relationship of various individuals. The method of transplanting frog skin is described. This is considered important for the future discrimination of individual-species-and-family-differentials and possibly of use in determining the monophyletic or the polyphyletic origin of the animal kingdom.—*Helen D. Hill.*

7704. Federley, H. **Über polymere Factoren bei Lepidopteren. [Polymerous factors in Lepidoptera.]** Zeitschr. Indukt. Abstamm.- u. Vererb. 30: 284–286. 1923.—This paper discusses polymerous factors in *Spilosoma lubricipeda-intermedia-zatima*. These have been analyzed by crossing but the exact analysis is lacking. The presence of polymerous factors should always be taken into account in selection experiments.—*Helen D. Hill.*

7705. Geier, M. **Rosa lutea und ihr Einfluss auf die Entwicklung der Rosenzucht. [Rosa lutea and its influence upon rose breeding.]** Gartenwelt 27: 212–214. 1923.—In Germany and abroad *Rosa lutea* has often been used in hybridization. Gustav Grünerwald (Lambert 1913) is a hybrid between Grossherzogin Victoria Melitta and *R. lutea bicolor* and is still one of the best hybrids. Johannisfeuer (Türke 1910) originated from Princesse de Baern × *R. lutea bicolor* and the young shoots, especially, show the influence of *R. lutea*. The flower color is bright red on a yellow basis. Lambert used Polyantha roses with *R. lutea bicolor*, and thus originated Aschenbrode 1 (= Petite Leonie × *R. lutea bicolor*) which has pink flowers with salmon orange centers. In Mieze, which has the same parents, and in Tip-top (= Trier × *R. lutea bicolor*) the lower part of the petals is copper orange-yellow, becoming yellow toward the base; the margin is yellowish red. Some other hybrids carry blood of the Crimson Rambler, while still others are derived from tea roses.—*J. C. Th. Uphof.*

7706. Goldschmidt, R. **Das Mutations problem. [The mutation problem.]** Zeitschr. Indukt. Abstamm.- u. Vererb. 30: 260–268. 1923.—Mutations of 3 types are discussed: (1) Change of single gene; (2) change of group of genes; (3) change by doubling of 1 chromosome or whole set. The genetic problem is concerned with gene mutation which arises through change in gene. Goldschmidt inclines to the belief that mutation does not occur easily. Mutation presents change of gene which influences its functioning. Changes of gene which can lead to viable mutants are exceedingly limited. Mutative changes of the gene are not localized either chronologically or in space. Multiple allelomorphs are regarded as different quantitative conditions of the same gene. The author's work with moths and with bar-eye *Drosophila* work are cited as evidence. Mutation is thus regarded as a quantitative change in the gene. He considers present proof of qualitative changes impossible. The cause of mutations is absolutely unknown. It is assumed that genes of a pair of conjugants must be in similar condition and it is considered too early to draw conclusions for the significance of mutation in species formation.—*Helen D. Hill.*

7707. Goldschmidt, R. **Experimenta crucis zur Geschlechtsumwandlung. [Experimenta crucis in reversal of sex.]** Zeitschr. Indukt. Abstamm.- u. Vererb. 30: 274. 1923.—Males arising from changed females have the heterogametic constitution of females. This is discussed under "Intersexuality" III, in the same journal.—*Helen D. Hill.*

7708. Hartmann, M. **Über sexuelle Differenzierung und relative Sexualität. [Sexual differentiation and relative sexuality.]** Zeitschr. Indukt. Abstamm.- u. Vererb. 30: 271–274. 1923.—The sexuality hypothesis remains as the only explanation of the phenomena of fertilization in the Protista. Physiological even in the absence of morphological differences are undoubted. Three assumptions are necessary for the sexuality hypothesis: (1) Every sexually differentiated individual and every gamete carries factors for the development of the opposite sex; (2) sex determination consists in the suppression of characteristics of 1 sex; (3) this is accomplished in either a genotypic-mendelian or a phenotypic manner. Among Protista are organisms (*Humaria granulata*) showing various degrees of sex tendencies. Quantitative differences are thus the foundation for sexuality. *Spirogyra, Speziana, Pandorina,* and *Actinophrys* indicate relative sexuality.—*Helen D. Hill.*

7709. Harvey, F. H. **Egg-laying tests at Hawkesbury Agricultural College. Twenty-second year's results, 1923–24.** Agric. Gaz. New South Wales 35: 357–368. *12 fig.* 1924.—The grand champion prize went to a pen of Langshans laying eggs of greatest market value of standard weight without bird replacement. A White Leghorn laid the maximum number of eggs, namely, 309. Detailed data of this contest and a summary of previous contests are given.—*L. R. Waldron.*

7710. Hayes, H. K., E. C. Stakman. Fred Griffie, and J. J. Christensen. **Reactions of selfed lines of maize to Ustilago Zeae.** Phytopathology 14: 268–280. 1924. [See this issue Entry 7845.]

7711. Honing, J. A. **Nicotiana deformis n. sp. und die Enzymtheorie der Erblichkeit. [Nicotiana deformis n. sp. and the enzyme theory of heredity.]** Genetica 5: 455–476. *2 pl., 5 fig.* 1924.—An account is given of the origin and genetic behavior of a dwarf, abnormal form of *Nicotiana Tabacum* which arose in Sumatra as a mutant in Deli-tobacco. Homozygous *N. deformis* in Sumatra is much dwarfed, the internodes are short, the leaves are almost devoid of blades, and the plants do not blossom. In Holland this form grows 3 or 4 times as tall, the internodes are longer, the leaves have broader blades, flowers are produced and selfed seed may be secured. Genetic studies indicate a single factor difference between normal and *N. deformis,* with the heterozygote intermediate. The mutant 1st appeared as a heterozygote. Various teratological peculiarities of *N. deformis* and the heterozygote are discussed at length. The heterozygote exhibits a tendency to take on the characters of *N. deformis* more strongly as development proceeds. From this fact the author compares it to certain of Goldschmidt's Lymantria hybrids, and argues that the difference between the normal and *N. deformis* is quantitative and that the genes are enzymic in nature.—*R. E. Clausen.*

7712. Huestis, R. R. **The heredity of microscopic hair characters in Peromyscus.** Proc. Nat. Acad. Sci. [U. S. A.] 9: 352–355. 1923.—Based on the microscopic examination of hair samples, the proportion of hairs in each of 4 classes defined by size and color was determined for certain races of *Peromyscus* and the F_1 and F_2 generations of 3 racial crosses. For 1 cross, 3 additional characters were measured: length of whole hair, of Agouti band, and of distal dark tip. Different races gave different mean values for these characters. The filial generations were intermediate between the parental conditions; the F_2 was consistently more variable than the F_1. The writer accepts the multiple factor theory as the explanation of this and other results of sub-specific crosses within the same genus.—*E. C. MacDowell.*

7713. Imai, Yoshitaka. **Genetic studies in morning glories, VIII. On the linkage value of yellow leaf and brown flower.** (English summary.) Bot. Mag. Tokyo 38: 9–16. *Illus.* 1924.—By examining Miyazawa's data the author has already pointed out elsewhere the occurrence of linkage between yellow leaf and brown flower. But the segregation being represented in a repulsion fashion, the data were not fitted for determining the cross-over percentage in such a case of strong linkage. On this point of view the author made some crosses which were expected to obtain the coupling segregation. By the data obtained from

these hybrids the cross-over percentage was determined, the frequency being on the average 1.04%. In such a circumstance, with repulsion segregation, there may be expected only 1 double recessive for approximately each 40,000 observed; this was actually the case.—*Author.*

7714. Imai, Yoshitaka. **Genetic studies in morning glories. IX. On the behavior of factor for the willow leaf in Pharbitis Nil.** (English summary.) Bot. Mag. Tokyo 38: 27–44. *Illus.* 1924.—The willow leaf behaves as a recessive to the normal and these 2 constitute multiple allelomorphs with the maple leaf. The order of dominancy of these 3 forms is normal (*M*)—maple (*m*)—willow (*m'*). In the combination of the other leaf form factors, such as heart, "sasa," "rangiku," etc., the willow produces a particular leaf form in every case. On the willow plants the maple branches sometimes appear as a vegetative sport; a few maple mutants may also be found in the segregating families. The mutation is caused by the transformation of the factor *m'* to *m*. The frequency of mutation was determined by the actual data.—*Author.*

7715. Ivanov, L. A. **Современное состояние вопроса о засухоустойчивости растений. [The present state of the question of drought resistance.]** (Russian with English summary.) Bull. Appl. Bot. & Plant Breed. 13: 3–32. 1923.—From a critical survey of the literature it is pointed out that rapid transpiration is of positive advantage rather than a disadvantage in the economy of the plant under conditions of drought. Recently, doubt has been cast on the efficiency of stomata and cuticular appendages in regulating transpiration. More directly, drought resistance depends upon the absorptive capacity of the root system and also upon its structure. Further, the conducting capacity of the stem, utilization of dew, capacity of developing dwarfness, length of the growth period, and partial cessation of vital functions must all be considered in studying drought resistance, but such studies must be conducted under natural conditions.—*L. R. Waldron.*

7716. Kajanus, Birger. **Genetische Untersuchungen an Weizen. [Genetic investigations in wheat.]** Bibliotheca Genetica. [Leipzig] 5: 1–187. *6 pl.* 1923.—This is a monograph on inheritance studies in wheat made by the author during the past decade. The material consists of 22 crosses, about ½ of which were between different varieties of *Triticum vulgare;* the others consisted of *T. vulgare* crossed with *T. compactum, T. spelta, T. turgidum, T. dicoccum,* and with a speltoid originating from a *T. vulgare* × *T. turgidum* cross, and reciprocal—*T. compactum* × *T. spelta* crosses. Most *T. vulgare* × *T. vulgare* crosses yielded speltoids in the F_2. The different proportions of speltoid to vulgare are accounted for by the assumption of 4 different modes of reproduction of germ cells. Species of *T. spelta* crossed with *T. vulgare* or *T. compactum* show a predominance of speltoid characteristics in the F_1. Usually the segregation was 3:1, but in 1 instance a distinct 1:2:1 segregation was observed. Among *T. compactum* × *T. spelta* segregates, many dense speltoid (*SSCC*) forms were obtained. In *T. compactum* × *T. vulgare* crosses 2 factors, namely, *C* for compactness, and *L* for laxness, were concerned. The effect of the latter being weak the segregation ratio approached 3:1. *T. vulgare* × *T. turgidum* crosses yielded forms resembling spelta and durum types. With *T. dicoccum,* the segregating population yielded still further new forms. The 1st generation in bearded × beardless crosses was invariably beardless or with short beards at the tip of the terminal spikelets. The F_2 showed intergradation, the beardless plants forming about ¾ of the population. Hairiness and color of the glumes were found to be affected by a 3rd factor. Color of the grain was caused by 1, 2 and sometimes 3 factors for red color. The degree of thickness of the culm or the presence of pith in the culm varied in different individuals of the segregating generation, but hollow culm was dominant and the segregation approached 3:1. In certain crosses coupling occurred between beardlessness and the vulgare type as contrasted by beardedness with the speltoid type. The author discusses genetic relationships of wheat species.—*S. Boshnakian.*

7717. Kajanus, Birger. **Über eine eigenartige Ährenanomalie beim Weizen. [Concerning a peculiar spike abnormality in wheat.]** Hereditas 5: 217–221. *1 fig.* 1923.—The wheat type under consideration had an occasional adventitious spikelet arising from underneath a normal spikelet. Plants with ears of this type were discovered in the progeny of a *Triticum vulgare* × *T. spelta* cross. This character behaved as a recessive, although the variation in

the proportions of normal to abnormal types was considerable. The factor for this abnormality is believed to have been introduced by the *T. vulgare* parent.—*S. Boshnakian.*

7718. Kniep, H. **Über erbliche Änderungen von Geschlechtsfactoren bei Pilzen.** [Hereditary changes of sexual factors in fungi.] Zeitschr. Indukt. Abstamm. -u. Vererb. **30**: 268–271. 1923.—*Schizophyllum commune* and *Aleurodiscus polygonis* show segregation into 4 sexually different haploid genotypes. Normally each of these can react with only 1 of the others. *Schizophyllum* occasionally produces cases in which the genotypes differ in some way so that they are capable of reaction with either of 2 others. The author obtained zygotes containing 2 and 3 mutated genes respectively and considers securing 4 mutated genes a possibility.—*Helen D. Hill.*

7719. Křiženecký, J. **Beziehung der Variabilität der Körpergrösse zu den Assimilations-Verhältnissen und die spezifische Veränderung dieser Variabilität.** [Relation of variability of body size to assimilation and specific change of this variability.] Zeitschr. Indukt. Abstamm.- u. Vererb. **30**: 317–318. 1923.—A positive relation was found to exist. Changes were induced by changes in nutrition. The possibility of innate glandular activity conditioning responses to nutrition is indicated, and it is probably heritable.—*Helen D. Hill.*

7720. Lambert, W. V., W. S. Rice, and H. C. A. W. Walker. **Food and parthenogenetic reproduction as related to the constitutional vigor of Hydatina senta.** Biol. Bull. **44**: 192–203. *1 fig., 7 tab.* 1923.—Rotifers fed exclusively on colorless protozoan food suffered decline of vigor through part of a series of parthenogenetic generations; those fed on green protozoan food remained vigorous. Previous results indicating decline of vigor due to continued parthenogenesis are held to have been due to unbalanced food conditions.—*A. Franklin Shull.*

7721. Lopriore, G. **Über die Vererbung teratologischer Missbildungen.** [Inheritance of teratological deformities.] Zeitschr. Indukt. Abstamm.- u. Vererb. **30**: 323–327. *Fig. 1–6.* 1923.—These deformities are not easily fixed in one progeny. Fasciation in maize was studied and was found to increase in successive generations, finally becoming hereditarily constant. An exception was recently reported in "Stazioni sperimentali agrarie Italiane." —*Helen D. Hill.*

7722. MacDowell, E. C. **Experiments with rats on the inheritance of training.** Science **59**: 302–303. 1924.—Three successive generations of albino rats (220 in all) were trained to find their food at the center of a circular maze. Tabulated summaries of learning-data show that progeny from trained parents and grandparents take as long to learn the maze as did the 1st generation trained.—*Author.*

7723. Mohr, O. L. **Das Deficiency-Phänomen bei Drosophila melanogaster.** [The deficiency phenomenon in Drosophila melanogaster.] Zeitschr. Indukt. Abstamm.- u. Vererb. **30**: 279–283. 1923.—Two new effects of deficiency are changes in dominant characters and exaggeration. (Deficiency notch 8 acts as ultra-white gene.) Crossing-over was found to be eliminated in the affected region. Deficiency is lethal in males. The author considers that the loss hypothesis is more nearly in accord with the facts of deficiency than the chain mutation idea. The deficiency phenomenon gives overwhelming proof of the linear arrangement of genes and of the reality of the chromosome map.—*Helen D. Hill.*

7724. Moore, A. R. **Note on dominance in the hybrid plutei of sea-urchins.** Jour. Exp. Zool. **38**: 207–211. *1 pl.* 1923.—This article contains photographs of plutei of 2 California species of sea urchins and their reciprocal hybrids, described in an earlier article (Arch. Entwick. d. Org. **29**: 354–362), included because correctness of description in that article has been called in question. Repetitions of the experiments during 3 successive years yielded always the same result, and there was no seasonal variation such as was described by Shearer, de Morgan and Fuchs.—*A. Franklin Shull.*

7725. Morgan, T. H. **The modern theory of genetics and the problem of embryonic development.** Physiolog. Rev. **3**: 603–627. *8 fig.* 1923.—The author states that the following assumptions underlie modern ideas of the relation between genetics and development: (1) The orderliness of the developmental process, since the eggs of an individual regularly develop into the same kind of individuals under constant environment; (2) since many species develop under identical environmental conditions, the differences must reside in the eggs; and (3) if an alteration (mutation) takes place in the composition of an egg, the

end product of development is different, and if the eggs possess the same alterations, this difference persists in following generations.—The experimental evidence for the particulate composition of the germ-material is reviewed. The essential features of segregation, independent assortment, linkage, and the linear order of genes are presented, together with a revised map of the most fully investigated mutant characters in *Drosophila melanogaster*. The correspondence between chromosome behavior and genetic results are reviewed, with particular emphasis on unique cases of correspondence, as shown by the inheritance of sex-linked characters, and by non-disjunction of the sex chromosomes, double-X, triplo-IV, haplo-IV, and triploid conditions in *Drosophila melanogaster*. The author admits that little is known as to the manner in which the genes produce their physiological effect. He presents evidence as to the stability of the gene, but states that nothing is really known as to the nature of this stability. Arguments are presented in opposition to the presence-absence theory of allelomorphism. Cases of cytoplasmic inheritance are confined to transmission of plastids in plants; aside from these cases, chromosomal inheritance appears to be the logical interpretation of genetic evidence. The genetic evidence indicates that the cytoplasm plays a minor role in heredity, and further that while the cytoplasm may be as important in development as the chromosomes, its activities are governed by them.—*R. E. Clausen.*

7726. Morgan, T. H., A. H. Sturtevant and C. B. Bridges. **The constitution of the germ-material in relation to heredity.** Carnegie Inst. Washington Year Book 22: 283–287. 1923.—An account is given of progress in the Drosophila investigations. In *Drosophila melanogaster* about 40 new mutants have been discovered, including several new dominants. Improvements in the maps have been effected by the use of these and by additional studies of old mutants. New multiple stocks have been made up for detailed studies of chromosome behavior. Balanced stocks have been used extensively in maintaining lethal, poorly viable, or sterile forms. Two new cases of transfer of material from 1 chromosome to another are reported, and a number of new instances of deficiency have been discovered. It has been found that in "double yellow" females, the two attached X-chromosomes occasionally break apart, but the break does not always occur at the original point of union. Further tests have been made of the hypothesis that reversion in bar depends upon crossing-over. Reversion occurs only in females and late in the history of the germ cells. Zeleny's data show also that homozygous bar and ultra-bar heterozygous for normal have approximately the same number of ommatidia. In cooperation with E. G. Anderson, studies of crossing-over in the X-chromosomes of triploid females show that crossing-over may occur between all 3 X-chromosomes simultaneously. Frequently offspring are secured in which the 2 X-chromosomes are duplicates for a part of the length, but different in the remaining part, which indicates that each of the original chromosomes was in the 2-strand stage at the time of crossing-over. Crossing-over is found to be more frequent in the left end of the X-chromosome and less frequent in the right in triploid as compared with normal females. A number of autosomal mosaics have been discovered, most of which appear to be due to double fertilization of a binucleate egg. A number of mutant genes have been found which change a mutant character back to wild-type. One of the tumor stocks has changed in such a way that males die before the tumor develops. In certain lines of the "double yellow" stock low ♀ ratios have been found to depend upon elimination of a certain proportion of the females. In *D. simulans* a useful new mutant has been discovered in each of the 3 genetically-known chromosomes. Eight isomorphic X-genes are known including both ends of the *D. melanogaster* X-chromosome. The map of the III-chromosome of *D. simulans* is now at least 10 units longer than the corresponding *D. melanogaster* map.—*R. E. Clausen.*

7727. Nachtsheim, H. **Deutsche Gesellschaft für Vererbungswissenschaft, Bericht über die zweite Jahresversammlung in Wien (25–27 September 1922).** [German Society of Genetics. Report on the second annual meeting in Vienna, Sept. 25–27, 1922.] Zeitschr. Indukt. Abstamm.- u. Vererb. 30: 257–331. 1923.—Papers presented are reported. Abstracts of individual papers are listed under names of authors in this issue.—*Frederick V. Rand.*

7728. Nachtsheim, H. **Parthenogenese, Gynandromorphismus und Geschlechtsbestimmung bei Phasmiden.** [Parthenogenesis, gynandromorphism and sex determination in Phasmidae.] Zeitschr. Indukt. Abstamm.- u. Vererb. 30: 287–289. 1923.—*Dixippus* (*Carausis*)

morosus, said to reproduce bisexually in India, was found to be parthenogenetic in practically all cases in cultures. Gynandromorphs are intermediate. Temperature effects on sex were investigated.—*Helen D. Hill.*

7729. Prizbram, H. **Temperaturmodifizierte Ratten und der Nachkommen.** [**Rats modified by temperature and their progeny.**] Zeitschr. Indukt. Abstamm.- u. Vererb. **30:** 290–291. 1923.—The length of tails was found to increase with increased temperature. Evidence is apparently against the inheritance of acquired characters on this point. The workers reported are Sumner, Uhlenhuth, Kammerer, Bierens de Haan, and Wiesner.—*Helen D. Hill.*

7730. Roemer, Th. **Partielle Variationen bei Lupinus angustifolius.** [**Partial variations in L. angustifolius.**] Zeitschr. Indukt. Abstamm.- u. Vererb. **30:** 296–299. 1923.—Changes from dominant to recessive and the reverse were observed. The findings are not in accordance with the presence-absence hypothesis. The author questions whether changes in F_2 are "late effects" of crossing, or mutations.—*Helen D. Hill.*

7731. Rüdin, E. **Über Vererbung geistiger Storungen.** [**Inheritance of mental disturbances.**] Zeitschr. Indukt. Abstamm.- Vererb. **30:** 299–300. 1923.—The general idea is that not much is known. A more complete discussion is given in Zeitschr. für die Gesamte Neurologie und Psychiatrie.—*Helen D. Hill.*

7732. Schiemann, E. **Genetische Studien zur Sortenunterscheidung der Gerste.** [**Genetic studies on varietal distinctions in barley.**] Zeitschr. Indukt. Abstamm.- u. Vererb. **30:** 293–296. 1923.—Linkage was found between factors for n-Basis and Lodiculae and the factor for summer character, and correspondingly between factors for e-Basis and Lodiculae and the factor for winter character. These results oppose those of v. Ubisch, who found Goldthorpe barley to have a dominant factor (E) for full head.—*Helen D. Hill.*

7733. Seiler, J. **Die Parthenogenese der Psychiden.** [**Parthenogenesis in the Psychidae.**] Zeitschr. Indukt. Abstamm.- u. Vererb. **30:** 286–287. 1923.—Two maturation divisions were found in *Solenobia triquetrella* F. R. and *S. pineti* Z. One corresponds to an equatorial division, the other compensates for nuclear fusion at the beginning of segmentation, reduces the tetraploid nucleus to diploid and prevents chromosome summation.—*Helen D. Hill.*

7734. Shelton, J. P. **Breeding wheats resistant to flag smut.** Agric. Gaz. New South Wales **35:** 336–338. 1924.—Data are given to indicate that by using certainintroduced varieties, particularly Galgalos, it should be possible to produce wheats which are resistant to the attacks of flag smut (*Urocystis tritici*). Galgalos showed no infection in 1922 or 1923.—*L. R. Waldron.*

7735. Shelton, J. P. **Plant breeding as a national asset. Three instructive graphs.** Agric. Gaz. New South Wales **35:** 327–330. *3 graphs.* 1924.—Data are given to indicate the increased varietal yields and increased total production in New South Wales resulting from the introduction of wheat varieties originated by William Farrer.—*L. R. Waldron.*

7736. Smith, F. F. **Self-fertilization in Nicotiana.** Science **59:** 461. 1924.—East has shown that self-sterility in *Nicotiana* is due to failure of the pollen tubes to reach the ovary before the decay of the flower. By pollinating young buds, additional time was gained and seed was set in 68% of the self-pollinations under these conditions. Fully opened flowers on the same plants set no seed following self-pollination. Results indicate that the gametes are not incompatible and that self-fertilization occurs readily if ♂ gametes can reach the egg. Apparently there is no "block" to self-fertilization in *Nicotiana* such as Morgan describes for *Ciona.*—*P. C. Mangelsdorf.*

7737. Storch, O. **Parthenogenese und Eireifung der heterogonen Rädertiere.** [**Parthenogenesis and maturation of the egg of heterogonous rotifers.**] Zeitschr. Indukt. Abstamm.- u. Vererb. **30:** 309–312. 1923.—Two kinds of eggs were found but the problem of controlling the development of 1 or the other is unsolved. The importance lies in the possibility of a direct influence on chromosomes.—*Helen D. Hill.*

7738. Vries, Hugo de. **Preferential fertilization in Oenothera Lamarckiana.** Bot. Gaz. **77:** 73–79. 1924.—The hybrid *Oenothera lucida* produces 2 kinds of gametes known as *laeta* and *deserens*. When pollen from various mutants is used on *O. lucida*, 2 types of plants are produced. Theoretically these 2 types should occur in equal numbers but experiments show that those resulting from fertilization of *deserens* ovules make up 78% of the total offspring.

When reciprocal crosses are made, 2 sorts of results occur. Pollen of *O. lucida* applied to small-flowered species with short styles gives the 2 expected types of offspring in equal numbers. When applied to large-flowered species with long styles there is always a deficiency of the offspring produced by the *laeta* gametes. Specimens resulting from fertilization by *laeta* gametes make up 21% of the offspring while those resulting from *deserens* gametes make up 79%. Apparently the *laeta* ovules as well as the *laeta* pollen grains are less effective in accomplishing fertilization than the *deserens* gametes.—*P. C. Mangelsdorf.*

7739. Warren, Don C. **Inheritance of egg size in Drosophila melanogaster.** Genetics 9: 41–69. *14 fig.* 1924.—Measurements of egg-size in 26 stocks of *D. melanogaster* disclosed characteristic differences which were found to remain constant despite differences in age and size of ♀ and in temperature. Genetic analyses of these differences were made by crossing stocks exhibiting extreme conditions. It was found that segregation for egg-size was independent of that for mutant characters. From crosses between abrupt (long) and bar (short), it was found that egg-size was influenced by several genic differences. One of the main factors for long egg was shown to be located in the X-chromosome, and the evidence indicated the existence of an additional autosomal gene for long-egg. Further tests indicated that the 3rd-chromosome from "abrupt" contained a gene for long-egg, and that the 2nd-chromosome possibly contained a gene having a minor effect on egg size. No 4th-chromosome genes affecting egg-size were demonstrated. Genetic analysis of the short condition of bar indicated that it was for the most part dependent on 2nd-chromosome genes with possibly a minor modifier in the 3rd chromosome. Genetic analysis of the long-egg condition in the apricot-vermilion-forked stock demonstrated the existence of a sex-linked gene; but the 2nd and 3rd chromosomes in this case seemed to bear no genes for the long-egg condition, and the 4th chromosome bore a plus modifier for egg-length. Selection for increased egg-size was found to be ineffective in the abrupt (long) stock, but selection for reduced egg size in the ruby (short) stock lowered the size to that characteristic of the bar stock. The genetic evidence further indicates that the autosomal genes for the long-egg condition are able to produce their effect without the aid of the sex-linked genes, and that if the sex-linked genes are homozygous and the autosomal genes are heterozygous, the long-egg condition will result. The homozygous condition of the gene for short is able to counteract the influence of the gene for long in the heterozygous condition, and the gene for short in the heterozygous condition has a slight reducing effect on the sex-linked gene for long in the homozygous condition. Crosses between any 2 stocks differing in egg-size gave F_1 females which produced eggs of intermediate size.—*R. E. Clausen.*

7740. Witschi, E. **Experimente mit Froschzwittem. [Experiments with frog hermaphrodites.]** Zeitschr. Indukt. Abstamm.- Vererb. 30: 277–279. 1923.—Results indicate the necessity of taking account of local races. One hermaphrodite was found to be genetically female. Juvenile and adult hermaphroditism of an undifferentiated race are rudiments of an earlier prevalent hermaphroditism.—*Helen D. Hill.*

7741. Wriedt, Ch. **Drei Mutationen bei Haustieren. [Three mutations in domestic animals.]** Zeitschr. Indukt. Abstamm.- u. Vererb. 30: 300. 1923.—One mutation was found in the horse, 1 in cattle (semi-lethal) and 1 in sheep.—*Helen D. Hill.*

7742. Zavitz, C. A. **Plant improvement in Ontario.** Agric. Gaz. Canada 11: 44–45. 1924.—The Government of the province of Ontario estimates that an increase of 249,730,411 bushels of wheat, barley and oats has been produced during the last 21 years due to an increase in yield per acre over that of previous years. Full credit is given to the Ontario Agricultural College for selecting and breeding higher yielding varieties. About 2,500 varieties have been tested and studied and some 50,000 hybrid plants have been grown. Brief mention is made of the most important varieties and strains.—*F. V. Owen.*

HORTICULTURE

J. H. Gourley, *Editor*
John Bushnell, *Assistant Editor*

(See also in this issue Entries 7524, 7541, 7553, 7587, 7665, 7683, 7684, 7692, 7697, 7705, 7852, 7934, 8025, 8026, 8094)

FRUITS AND GENERAL HORTICULTURE

7743. Batchelor, L. D., A. W. Christie, E. H. Guthier and R. G. LaRue. **Sun-drying and dehydration of walnuts.** California Agric. Exp. Sta. Bull. 376. *1–26.* 1924.—Improper curing may reduce good nuts to culls, thus lowering their value 15–50%. The common method of sun-drying on ventilated trays is described. Covering the trays with a waterproof cover at night and during rainy weather reduces the losses from cracking. The cost and results from drying in unheated houses are about the same as for tray drying. Dehydration in heated houses reduces the cracking to a very low percentage and increases the labor and marketing efficiency. The "critical" drying temperature is about 110°F.; the higher the moisture content of the nuts the lower is this critical point. The various types of dehydraters are described.—*A. R. C. Haas.*

7744. Benary, Ernst. **Die Anzucht der Pflanzen aus Samen im Gartenbau.** [Growing horticultural plants from seed.] *3rd ed. viii + 355 p.* Paul Parey: Berlin, 1923.—Following the introduction, Part I takes up such general questions as soils, hotbeds, the seed bed, sowing, care of seeds and seedlings, and notes on diseases and pests. Part II discusses details for growing a large number of specific plant species and varieties, including vegetables and other crop plants, ornamentals, and woody plants, each of these main sections being divided into smaller horticultural groups. The handbook concludes with a tabulation of instructions for growing specific plants from seed, arranged alphabetically by genera. There are no illustrations.—*Frederick V. Rand.*

7745. Blackman, G. H. **Top working pecan trees.** Florida Agric. Exp. Sta. Bull. 170. *165–188. Fig. 56–76.* 1924.—Methods of top-working both by budding and grafting are described. Pecans are successfully top-worked on hickories, *Hicoria alba* being generally used.—*J. C. Th. Uphof.*

7746. Blank, R. J. **Citrus fruit growing in the Everglades of Broward County.** Citrus Indust. 5^6: 5–7. *5 fig.* 1924.—A description is given of citrus fruit growing in parts of the Everglades, Florida, a region where soil conditions have been considered unfavorable for them.—*J. C. Th. Uphof.*

7747. Boller, W. E. **Paper mulch for bananas.** Florida Grower 29^5: 7. 1924.—Covering the soil with 4 or 5 thicknesses of old newspaper has been successfully used as a mulch for young bananas. The ground is first cleared of all weed growth. This is an economical system of culture; it reduces the soil temperature, and favors the soil flora.—*J. C. Th. Uphof.*

7748. Broadfoot, H. **The British standard apple case.** ($18 \times 10\frac{1}{2} \times 11\frac{1}{2}$). Agric. Gaz. New South Wales 35: 373–375. 1924.—A discussion of the new packing case is given with packing results from the variety Granny Smith. Certain modifications are necessary in packing methods if the new case is to be used. Its use is recommended.—*L. R. Waldron.*

7749. Esser. **Der Schöne von Boskoop als Buschbaum.** [Schöne von Boskoop as a bush tree.] Gartenwelt 27: 299–300. 1923.—The Schöne von Boskoop apple grown on paradise stock declines in yield at the 20th year. This is accompanied by death of the twigs.—*J. C. Th. Uphof.*

7750. Hamel, Claude C. **The Litchi.** Florida Grower 30^1: 7. 1924.—This nut can be grown as far north as Tampa, Florida. Brief cultural suggestions are given. It is most successfully propagated by layering.—*J. C. Th. Uphof.*

7751. Hodgson, R. W. **Saving the gophered citrus tree.** California Agric. Exp. Sta. Circ. 273. *1–19.* 1923.—This is a discussion of the principles of bridge-grafting and of inarching in relation to the recovery of trees injured by gophers.—*A. R. C. Haas.*

7752. Jaenichen, R. **Die Unterlagenfrage in Obstbau.** [**The question of stock in fruit raising.**] Gartenwelt 27: 20–21. 1923.—Variations are noted in fruit trees due to the kind of stocks on which they are grown. Schöne von Boskoop apple on Goldparmäne stock is better colored than when grown on other stock. Josef von Mechelen apple is 3–4 weeks earlier on Neue Poiteau than on other stock. Muskatelle pears develop well on Colomas-Herbstbutterbirne. St. Julien is recommended as a plum stock, Quitte von Angers (quince) for dwarfing pears, and Improved French Doucin for the apple. Metzer is the best of the paradise stocks.—*J. C. Th. Uphof.*

7753. McAtee, W. L. **Trilisa on the market.** Torreya 24: 50. 1924.—Large quantities of *Trilisa paniculata* and *T. odoratissima*, sometimes amounting to 100 tons annually, are gathered in Liberty, McIntosh, and Glynn Counties, Georgia, for incorporation into smoking tobaccos.—*J. C. Nelson.*

7754. Meymund, Kurt. **Die Unterlagen in der obst Baumschule.** [**Stock in the fruit tree nursery.**] Gartenwelt 27: 10–11, 19–20. 1923.—Specific stocks are recommended for the various varieties of apple, pear, and cherry, together with directions for the propagation of these stocks. Cherries are worked on *Prunus Mahaleb* to secure dwarfs or espaliers. This stock is propagated from seed in contrast with the doucin, paradise, and quince stocks which are developed from mound layering or cuttings.—*J. C. Th. Uphof.*

7755. Newell, Wilmon. **The tung-oil tree in Florida.** Florida Agric. Exp. Sta. Bull. 171. *189–234. Fig. 77–96.* 1924.—Tung-oil, extracted from the nuts of *Aleurites fordi* Hemsl., is a drying oil used in paints and varnishes. The history of the species and of the industry both in China and in the U. S. A. is given. Cultural methods, including soil requirements, pruning, fertilizing, distance of planting, and insects and diseases are presented in detail. The trees are grown from seed, and considerable variation in productivity of individuals occurs. Land costing more than $150. per acre will not yield profitable returns.—*J. C. Th. Uphof.*

7756. Rimann, Carl. **Gehölze für ausdauernde Hecken.** [**Woody plants for permanent hedges.**] Gartenwelt 27: 261–262. 1923.—A list is given of species used for hedges, with brief descriptions and cultural suggestions.—*J. C. Th. Uphof.*

7757. Rimann, Carl. **Primula denticulata grandiflora als Topftrieb- und Schnittblumenpflanze.** [**Primula denticulata grandiflora for forcing in pots and for bouquets.**] Gartenwelt 27: 229. 1923.—The method of growing the plant from seed is given. For forcing, 2-year or older plants are potted and placed in cold frames in the fall.—*J. C. Th. Uphof.*

7758. Sandhack, Hermann A. **Erdbeertreiberei.** [**Strawberry forcing.**] Gartenwelt 27: 2–4. *2 fig.* 1923.—The high cost of heating greenhouses has brought about a practice of forcing strawberries in unheated houses. The crop is earlier than that grown in cold-frames.—*J. C. Th. Uphof.*

7759. Schipper. **Lohnt es sich altere Obstbäume zu verpflanzen.** [**Does it pay to transplant old fruit trees?**] Gartenwelt 27: 141. 1923.—Trees worked on quince, doucin or paradise stock can be transplanted more safely than those on standard stock. Trees that are making an excessive growth are sometimes benefited by this practice. The details of procedure are outlined.—*J. C. Th. Uphof.*

7760. Sprenger, A. M. **Enkele gedachten omtrent het onstaan en wijziging van vruchtbaarheid.** [**Some conceptions about the origin and modification of fertility.**] Natuurwetenschapp. Tijdschr. 5: 149–164. 1923.—The author holds that fertility varies (1) with the age of the plant, (2) on the different parts of the tree, (3) with different individual trees under apparently the same environmental conditions, (4) with the seasons, and (5) with the rate of growth. The possibility of increasing fertility is presented.—*J. C. Th. Uphof.*

7761. Stahel, G. **Kort verlag omtrent de werkzaamheden ten behoeve van de selectie van koffie, cacao en sinaasappelen.** [**Report on selection of coffee, cacao and oranges.**] West Indië 8: 58–60. 1924.—This is a report of progress.—*J. C. Th. Uphof.*

7762. Tufts, W. P., and G. L. Philp. **Pear pollination.** California Agric. Exp. Sta. Bull. 373. *1–36.* 1923.—A 12% cane sugar solution gave during 7 seasons an entirely satisfactory artificial germination of pear pollen. There is comparatively little variation in the amount of pollen produced by various pear varieties but pollen is always abundant. The blooming

period for most pears is comparatively short. With the exception of several of the earliest and latest bloomers all varieties overlap in their period of bloom. Bartlett is to a limited extent self-sterile under interior valley and coastal conditions. Under Sierra Nevada foothill conditions it is almost entirely self-sterile (at least in certain years) and therefore should not be planted without pollinizers. Winter Nelis has proved to be the best pollinizer for the Bartlett under all conditions tested. Under valley conditions, the Comice, Bosc, and Hardy have proved to be satisfactory pollinizers for the Bartlett; Howell, Angouleme, Anjou, and Forelle have given fair results. Near the coast, Comice, Clairgeau, and Easter proved satisfactory as pollinizers for the Bartlett. In the Sierra Nevada foothills, Bosc, Comice, Anjou, Easter, D. Hovey, and Howell are recommended as pollinizers for the Bartlett in the order named. Winter Nelis has been largely self-sterile under all conditions tested but is successfully pollinated by Bartlett. Alecon, Bloodgood, B. S. Fox, Comet, Forelle, LeConte, and Madeline are almost entirely self-sterile under valley conditions. Comice, Flemish Beauty, Hardy, and Howell may be classed as self-fertile in the valleys. Angouleme, Anjou, Bosc, Clapp Favorite, Clairgeau, Col. Wilder, Dana Hovey, Easter, Gifford, Glout Morceau, Kieffer, P. Barry, and Seckel may be considered doubtful, and the writers would not recommend that they be planted under valley conditions without provisions for cross-pollination. In the coastal region, Clairgeau, Comice Howell, and Hardy are almost self-sterile, while Bosc, Easter, ahd Glout Morceau are fairly self-fertile. Anjou, Bosc, Comice, D. Hovey, and P. Barry are self-sterile under foothill conditions. Pear fruits resulting from cross-pollination do not appear to exhibit the same tendency to fall after the June drop as do those resulting from self pollination. Pollinating agencies such as honey bees are necessary to set a good crop of fruit. Care should be taken in the arrangement of varieties in the orchard to facilitate cross-pollination and convenience in orchard management.—*A. R. C. Haas.*

7763. Vaile, R. S. **A survey of orchard practices in the citrus industry of southern California.** California Agric. Exp. Sta. Bull. 374. *1–40.* 1924.—Citrus orchards near the coast produce higher yields than those in the interior. Valuations fluctuate accordingly. Soils of medium texture are about equally valuable for citrus trees; heavier and lighter soils are less productive. Annual yields increase until the trees are 35 years old. Nitrogen and bulky organic manures appear to be the only fertilizers required. The most profitable amount of fertilizer varies with several factors; examples are given. Excessive applications of N apparently produce mottling. Winter cover crops give better results than clean cultivation, while summer cover cropping produces a poor condition of the trees. Irrigation is an important factor in yield. In general, less water and fewer irrigations are used near the coast than in the interior. The citrus industry seems to have reached a stage of economic stability.—*A. R. C. Haas.*

7764. Wissebroek, Alex. **Erdbeertreiberei, Erfahrungen mit Royal Sovereign.** [Strawberry forcing, experiences with Royal Sovereign.] Gartenwelt 27: 36–37. 1923.

FLORICULTURE AND ORNAMENTAL HORTICULTURE

7765. Flint, C. L. **Marketable California decorative greens.** California Agric. Exp. Sta. Circ. 275. *1–15.* 1924.—The author states that some attention should be given to those areas where native greens are growing, to prevent their eradication; legislation such as exists for the protection of the Christmas redberry is advisable. The annual value of native greens in California is approximately $270,000. Suggestions on marketing are given.—*A. R. C. Haas.*

7766. Kache, Paul. **Eigigen der besten neue Gladiolen.** [Some of the best new gladioli.] Gartenwelt 27: 252. 1923.—Three new varieties of the Gandavensis group are described: Bertha Schöllhammer with large salmon red flowers; Frau N. von Weinberg with large carmine red flowers; and Maria Swinghammer having pink flowers variegated with salmon.—*J. C. Th. Uphof.*

7767. Kache, Paul. **Ein Beitrag zur Amaryllis-Kultur.** [Amaryllis raising.] Gartenwelt 27: 124–125. 1923.—General directions are given on the culture of hybrids.—*J. C. Th. Uphof.*

7768. Kache, Paul. **Einige gute neue Dahlien der Firma Papa & Bergmann.** [Some good new dahlia varieties.] Gartenwelt 27: 179–181. *4 fig.* 1923.—New dahlia varieties, originated by Pape and Bergmann of Quedlinburg, include: Kaiser Heinrich, flowers gold, shaded with pink and orange, resembling Insulinde; Alex Pape, flowers orange, with red shades; G. Bornemann, flowers fire red; Dora Herzog, early and prolific, flowers salmon red shading to yellow in the center; Obergärtner Dillage, resembling Meisterstück, flowers Cattleya violet; Sonnekönigin, flowers yellow; and Die Braut, with flowers of an appleblossom red. —*J. C. Th. Uphof.*

7769. Kühn, K. **Frühe kleinblumige Chrysanthemum.** [Early small flowering Chrysanthemum.] Gartenwelt 27: 69–70. 1923.—Small flowering chrysanthemums may become more important as pot plants and for bouquets. After observations in Lewaschowo, Russia, the author recommends Pluie d'argent with white flowers; Horace Martin, dark yellow; Goacher Krimson, bronze color; Suvosy, large pink flowers; Gustav Grünerwald, pink flowers; and Parisiana with white flowers. Propagation and culture of the plants are described.—*J. C. Th. Uphof.*

7770. Sandhack. **Graetz'sche Gladiolen.** [Graetz's gladioli.] Gartenwelt 27: 33–36. *6 fig.* 1923.—The following gladioli originated at the nursery of Berthold Graetz in Cologne, are described: Lene Graetz with white flowers; Deutschland with pink; Silberfee with yellow; Lore with yellow with orange spot; and Symphone with orange flowers. Most of these have originated from crosses between *Gladiolus gandavensis* and the yellow flowering *G. primulinus* from Kilimandscharo.—*J. C. Th. Uphof.*

7771. Sprenger, Carl. **Narzissen Hybriden.** Gartenwelt 27: 156–157, 164–165. 1923. The writer gives a description of his Narcissus hybrids of the Corriesii, Fenzii, Jordanii, Margaritae, Parlatoris, Dammaniana, Victorialis and of the Sprengeri Class. They were grown in Campania.—*J. C. Th. Uphof.*

7772. Voigtländer, B. **Lassen sich einheimische Orchideen mit Erfolg kultivieren?** [Are native orchids to be grown successfully?] Möllers Deutsch. Gärtnerzeitg. 39: 111. 1924.—Of the German orchids, *Epipactis palustris* can be most easily grown in marshy, loamy soils.—*J. C. Th. Uphof.*

7773. Zornitz, H. **Herbstastern zum Schnitt und zur Topfkultur.** [Autumn asters for bouquets and for pot growing.] Möllers Deutsch. Gärtnerzeitg. 39: 112. 1924.—The following asters are recommended: *Aster hybridus*, Blutenwolke, Eos, Heiderose, St. Egwin, Schneelawine, Herbstwunder, *Aster dumosus*, *Aster hybridus* de la Toussaint and Lavendel.—*J. C. Th. Uphof.*

VEGETABLE CULTURE

7774. Anonymous. **Bohnentreibsorten.** [Bean varieties for forcing.] Gartenwelt 27: 51–52. 1923.—Varieties are briefly described, and the essentials of good market sorts outlined.—*J. C. Th. Uphof.*

7775. H., M. **Grünbleibende Pal- oder Kneifelerbsen zur Trockengewinnung.** [Green Pal-or Kneifel peas for dry use.] Gartenwelt 27: 147. 1923.—Varieties are briefly described for the gardener and canner.—*J. C. Th. Uphof.*

7776. Hoffmann, G. **Die Feingemüsezucht.** [The growing of fine vegetables.] Gartenwelt 27: 61. 1923.—Directions are given for culture and bleaching of chicory, cardy, and seakale.—*J. C. Th. Uphof.*

7777. Kitschunow, Nicolas. **Der Samenbau des Weisskohls in Rusland.** [Seed growing of white cabbage in Russia.] Gartenwelt 27: 76–77. *Fig. 1–3.* 1923.—Methods of growing cabbage seed on a field scale are described. Where winter storage space is limited, the heads are trimmed so that only the stem is carried over winter. Such trimmed stems are less subject to rot in storage than the entire plant but must be protected by straw when set out, to prevent excessive drying.—*J. C. Th. Uphof.*

7778. Kuhn, K. **Der Feldanbau von Kopfkohl in Rusland.** [Growing cabbage in the field in Russia.] Gartenwelt 27: 77. 1923.

7779. Nicolaisen, N. **Anbauwürdige Gemüsesorten.** [Vegetable varieties.] Gartenwelt 27: 49–51. 1923.—A list is presented of the best varieties which can be grown in Ger-

many and which have been tested in various experiment stations and recommended in different publications.—*J. C. Th. Uphof.*

7780. Schipper. **Die Bohnentreiberei als Nebenkultur.** [**Bean forcing as a secondary culture.**] Gartenwelt 27: 4–5. *1 fig.* 1923.—The author recommends beans for an intercrop in grape, peach or cucumber houses, and gives cultural suggestions.—*J. C. Th. Uphof.*

7781. Tiemann, A. **Zur Kultur des Spargels.** [**Asparagus growing.**] Möllers Deutsch. Gärtnerzeitg. 39: 125–126. 1924.—Fertilizing, soil treatment, and planting of asparagus are described. The best varieties are Ruhm von Braunschweig and Schneekopf.—*J. C. Th. Uphof.*

MORPHOLOGY, ANATOMY, AND HISTOLOGY OF VASCULAR PLANTS

E. W. Sinnott, *Editor*

(See also in this issue Entries 7573, 7574, 7829, 7923, 7974, 7977, 8068, 8099

7782. Arber, Agnes. **Leaves of Triglochin.** Bot. Gaz. 77: 50–62. *Pl. 8–10.* 1924.—Nine species of the subgenus *Eutriglochin* and the 1 species of the subgenus *Cycnogeton* were studied. Amphivasal bundles occur in the foliage leaves, which are comparable to those in the upper part of the coleoptile of *Avena* and in the scutellum of *Hordeum.* Replacement of normal bundles by fiber strands was noted in the scale leaves. The leaf apex shows a relative increase in the development of the xylem, the elements of which fuse by means of tracheal branches. The leaves of *T. striata* var. *montevidensis* and of *T. procera* belong to the "ribbon" type. The author finds a parallel existing between these leaves and those of *Sagittaria sagittifolia,* from the standpoints both of external and of internal characters. —*B. W. Wells.*

7783. Choux, Pierre. **Nouvelles études biologiques sur les Asclépiadacées de Madagascar.** [**New biological studies on the Asclepiadaceae of Madagascar.**] Ann. Mus. Colonial Marseille 31[1]: 1–50. 1923.—This is a morphological and biological study of various Madagascar Asclepiadaceae. The author shows what a wide range of polymorphism may be displayed by *Pentopetia androsaemifolia* and *P. cotoneaster.* He completes his previous studies on the tuberous Cynanchums of Madagascar, and in addition to *C. lineare, C. napiferum* and *C. helicoideum,* which are known to have this characteristic, he mentions 4 other species from Andringitra the subterranean parts of which are equally tuberous: *C. repandum* K. Schumann and 3 new species, *C. appendiculatum, C. papillatum* and *C. andringitrense.* With regard to *Decanema Bojerianum,* the author, calling attention to its great polymorphism, especially of the crown, doubts if the genera *Decanema* and *Cynanchum* should be separated. On the other hand, he does not believe it is possible to unite the genera *Stephanotis* and *Marsdenia,* as has been proposed. New observations are reported for other Asclepiadaceae, including *Cynanchum subcoriaceum, C. mahafalense, Marsdenia brevisquama, M. grandiflora,* and *M. Thouarsii. Ceropegia Perrieri* n.sp. is described.—*H. Jumelle.*

7784. Cook, Melville T. **Development of seed of Linaria vulgaris.** Bot. Gaz. 77: 225–227. *Pl. 16.* 1924.—Following the normal development of the embryo sac, the proembryo divides by 2 transverse walls—the 2 upper cells developing a spherical embryo, the lower a filamentous many-celled suspensor. The cotyledons develop unequally. The endosperm is of the cellular type. The development of the endosperm is the same regardless of the presence or absence of the embryo. The latter condition obtains in the majority of cases. —*B. W. Wells.*

7785. Gates, Frank C. **Three sets of megasporangiate cones per year in Pinus.** Bot. Gaz. 77: 340–342. *2 fig.* 1924.—This condition for a tree of *P. banksiana* at Manhattan, Kansas, is reported.—*B. W. Wells.*

7786. Louvel. **Notes sur les bois de Madagascar.** [**Notes on Madagascar woods.**] Bull. Econ. Madagascar et Dépendances 20: 181–198. *40 pl., 3 illus.* 1923.—Descriptions are given with plates, of a large number of Madagascar trees the wood of which may be useful for construction, carpentery or cabinet work. All these trees are designated by local names alone, which lack precision; and the botanical names which accompany some of these

local terms have not been checked by an examination of specimens (leaves, flowers and fruits) of the species. A part of this work has appeared in previous bulletins.—*H. Jumelle.*

7787. Macpherson, Gertrude E. **Comparison of development in dodder and in morning glory.** Bot. Gaz. **71:** 392–398. *Pl. 25–27.* 1921.—The development of the embryo-sac up to and including the 8-celled stage is the same both for dodder (*Cuscuta Gronovii* Willd. and morning glory (*Convolvulus sepium* L.). Later stages in *Cuscuta* appear to be the result of divisions in a number of planes but in no fixed order, resulting in embryos of irregular form either with no suspensor or with a suspensor of one cell. A large vacuolate suspensor is typical of the older embryos of *Convolvulus.* The embryo of the mature seed of *Cuscuta* bears 2 small scales near the apex, but from their relation to other parts of the embryo neither of them can be considered as cotyledons; the embryo of *Convolvulus* has 2 large cotyledons. No case of polyembryony was observed in *Cuscuta,* but in *Convolvulus* it was the usual occurrence in the development of the embryo.—*M. B. Morgan.*

7788. Medsger, Oliver Perry. **The man-of-the-earth or wild potato vine.** Torreya **24:** 39–41. *Pl. 3.* 1924.—The roots of *Ipomoea pandurata* Meyer attain very large size. A specimen examined showed a root 2½ feet long and weighing 15 pounds. These roots were eaten by the Indians. The plant is perennial, and may persist for a half-century at the same station.—*J. C. Nelson.*

7789. Posthumus, O. **On some principles of stelar morphology.** Recueil Trav. Bot. Neerland. **21:** 111–295. *20 fig.* 1924.—The anatomical structure, especially the situation of the vascular bundles, is presented in detail for certain groups of pteridophytes and seed plants, the distribution of the xylem, phloem, endodermis and parenchyma being particularly emphasized. As to the stelar morphology of the Osmundaceae, the author agrees with Kidston and Gwynne-Vaughan that the pith has originated by a reduction of the xylem. "The primitive form from which the Osmundaceae may have been derived was characterized by a solid mass of xylem in which the mesarch leaf-traces were inserted. It is very probable that the differentiation of the central xylem took place quite independently from that of the leaf-trace." The elementary strands of the leaf were mesarch in the higher portions. Both here and in other pteridophytes the reduction of the metaxylem in the leaf-trace has taken place adaxially to the protoxylem. In the Gleicheniaceae the stem xylem forms a single mass and in the axil of the leaf-trace a "funnel" of parenchyma originates. In *Gleichenia pectinata* pith is formed by reduction of the xylem of the stem and of the lower portion of the leaf-trace. In *Stromatopteris* the funnel does not reach the insertion of the leaf-trace, whereas in *Platyzoma* it reaches the xylem of the stem but does not interrupt it. In the Dineuroidaceae the peculiar form of transverse section of the petiole is caused by the different orientation of the pinnae. The parenchyma adaxial to the protoxylem strands interrupts the peripheral loop and is decurrent into the petiolar strand for a short distance above its insertion into the stem xylem. It is associated with the protoxylem and ends blindly as a funnel. In the Polypodiaceae and Cyathaceae the central part of the stem xylem is never reduced. In the spermatophytes the simplest structure is found in *Heterangium* which has a solid mass of xylem in the stem and leaf-traces not distinct below their insertion. Previous work on 119 species of pteridophytes is reviewed in detail.—*J. C. Th. Uphof.*

MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. Transeau, *Editor*

L. H. Tiffany, *Assistant Editor*

(See also in this issue Entries 7547, 7973)

7790. Bělař, K. [Rev. of: Zimmermann, W. **Zur Entwicklungsgeschichte und Zytologie von Volvox.** (The development and cytology of Volvox.) Jahrb. Wiss. Bot. **60:** 256–294. *Pl. 1, fig. 1–2.* 1921 (see Bot. Absts. 12, Entry 561).] Arch. Protistenk. **44:** 143–145. 1922.

7791. Czurda. [Rev. of: Arnaudow, Nicola. **Zur Morphologie und Biologie von Zoophagus insidians Sommerstorff.** (Morphology and biology of Zoophagus insidians.) Jahrb. Sofianer Univ. **15–16.** 1918–1919.] Arch. Protistenk. **47:** 139–140. 1923.

7792. Czurda, V. [Rev. of: Hemleben, H. **Über den Copulationsakt und die Geschlechtsverhältnisse der Zygnemales. (Copulation and sexual processes in the Zygnemales.)** Bot. Archiv 2: 249–259, 261–277. 1922 (see Bot. Absts. 13, Entry 4355).] Arch. Protistenk. 46: 386–388. 1923.

7793. Geitler, L. [Rev. of: Geitler, L. **Versuch einer Lösung des Heterocysten-Problems. (A solution of the heterocyst problem.)** Sitzungsber. Akad. Wiss. Wien. (Math. Nat. Kl.) I Abt., 130: 223–245. *1 pl.* 1921 (see Bot. Absts. 13, Entry 1781).] Arch. Protistenk. 47: 137–138. 1923.

7794. Lindemann, E. **Neue von G. J. Playfair beschriebende Süsswasserperidineen aus Australien, mit kritischen Bemerkungen über ihre systematische Stellung. [A discussion of the systematic position of the fresh-water peridinians described by Playfair from Australia.]** Arch. Protistenk. 47: 109–130. *24 fig.* 1923.—The following flagellates are described and figured: *Gymnodinium australe* Playf., *Glenodinium australicum* Playf., *Peridinium caudatum* Playf., *P. caudatum* var *guildfordense* Playf., *P. caudatum* var. *planktonicum* Playf., *P. caudatum* var. *morsum* Playf., *P. geminum* Playf., *P. geminum* var. *elegans* Playf., *P. geminum* var. *excavatum* Playf., *P. geminum* var. *angulosum* Playf., *P. umbonatum* var. *inaequale* Lemmermann (= *P. pusillum?* Lemm.), *P. umbonatum* var. *centenniale* Playf., *P. umbonatum* var. *ovale* Playf., *P. intermedium* Playf., *P. intermedium* var. *cornicum* Playf., *P. güstrowiense* Playf. (*P. willei* var. *australe* West), *P. striolatum* Playf., *P. striolatum* var. *rugosum* Playf., *P. striolatum* var. *truncatum* Playf., *P. striolatum* var. *acuminatum* Playf., *P. striolatum* var. *auburnense* Playf., *P. willei* var. *australe* West, *P. willei* var. *botanicum* Playf., *P. australe* Playf., *P. tabulum* var. *westii* f. *australis* Playf., *P. hieroglyphicum* var. *ovatum* Playf., *P. hieroglyphicum* var. *rotundum* Playf., *P. granulosum* Playf., *P. zonatum* Playf., and *Exuviella lima* (Ehrbg.) Schütt.—*R. P. Hall.*

7795. Mrozkowna, J. **Pringsheimia scuttata Reinke w zatoce Gdanskiej. [Pringsheimia scuttata Reinke in the gulf of Danzig.]** Acta Soc. Bot. Poloniae 1: 205–206. *Fig. 17.* 1923 [1924].

7796. Pascher, A. **Neue oder wenig bekannte Flagellaten. I. [New or little known flagellates.]** Arch. Protistenk. 44: 120–132. *14 fig.* 1922.—The author describes and figures the following flagellates: *Mallomonas genevensis* Chodat, *M. pascheri* Rehfous, *M. minima* Rehfous, *Chrysopyxis reckerti* Conrad, *Carteria oliveri* G. S. West, *Platymonas tetrathele* West a. a. O., *Chlamydomonas brachyura* West, *Chlamydomonas globulosa* Perty, *C. grovei* West, *C. microscopica* West, *C. elegans* West, *Pteromonas takedana* West, *Reckertia sagittifera* Conrad a. a. O., *Peridinium minusculum* Pavillard, *Thaurilens denticulata* Pavillard, *Bommeria viridis* Kufferath, *Solenicola setigera* Pavillard a. a. O., *Bicoeca mediterranea* Pavillard, and *Pteridomonas sphaerica* Kufferath.—*R. P. Hall.*

7797. Pascher, A. **Neue oder wenig bekannte Flagellaten. II. [New or little known flagellates.]** Arch. Protistenk. 44: 133–142. 10 fig. 1922.—The following flagellates are described and figured: *Chrysapsis sphagnorum* Conrad, *Chrysococcus reticulatus* Reverdin, *Mallomonas elongata* Reverdin, *Uroglenopsis apiculata* Reverdin, *Dinobryon elegans* Reverdin, *Dinobryon urceolatum* Reverdin, *Dinobryon campanuliforme* Reverdin, *Hyalobryon cylindricum* Reverdin, *Chrysamoeba helvetica* Reverdin, *Diceras chodati* Reverdin, *Stylo-ceras longissimus* Reverdin, *Chlorotriangulum minutum* Kufferath, *Lepocinclis pyriformis* Kufferath, and *L. ovum* (Ehrenbg.) Lem. var. *quadrata* Kufferath.—*R. P. Hall.*

7798. Pascher, A. **Neue oder wenig bekannte Flagellaten. III. [New or little known flagellates.]** Arch. Protistenk. 44: 397–406. *13 fig.* 1922.—The following flagellates are described and figured: *Pseudomallomonas bernardinensis* Chodat a. a. O., *Chlamydomonas bernardinensis* Chodat, *C. pteromonoides* Chodat, *C. polydactyla* Chodat, *Aglöe cylindrica* Pascher n. comb., *Chlorogonium bernardinense* Chodat, *Lobomonas bernardinensis* Chodat, *Trachelomonas bernardinensis* Vischer, *T. margaritifera* Conrad, *T. cribrum* Conrad, *T. amphora* Conrad, *T. kufferathi* Conrad, *T. torleyi* Conrad, *T. avoides* Conrad, *T. elegans* Conrad, *T. umbilicophora* Conrad, and *Bernardinella bipyramidata* Chodat.—*R. P. Hall.*

7799. Pascher, A. **Neue oder wenig bekannte Flagellaten. VII. [New or little known flagellates.]** Arch. Protistenk. 46: 141–147. *36 fig.* 1923.—The author describes and figures the following flagellates: *Rhizochrysis limnetica* G. M. Smith, *Spirodinium vorticella* Wolo-

szynska, *Gymnodinium hiemale* Woloszynska, *G. woloszynskae* Pascher, *G. leopoliense* Woloszynska, *G. cornatum* Woloszynska, *Chlamydomonas epiphytica* G. M. Smith, and *C. dinobryonis* G. M. Smith. References to important papers on these flagellates are included.—*R. P. Hall.*

7800. Pascher, A. [Rev. of: Huber, G., und Fr. Nipkow. **Experimentelle Untersuchungen über die Entwicklung von Ceratium hirundinella O. F. M.** (Experimental investigations on the development of C. hirundinella.) Zeitschr. Bot. **14**: 337–371. *12 fig.* 1922.] Arch. Protistenk. **46**: 383–385. 1923.

7801. Pascher, A. [Rev. of: Lindenmann, E. **Technische Winke für die Untersuchung von Süsswasserperidineen.** (Technical suggestions for the study of fresh water peridinians.) Mikrobiol. Monatschr. **12**: *13 p.* 1923.] Arch. Protistenk. **46**: 385. 1923.

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

(See also in this issue Entries 7543, 7826, 7872)

7802. Cardot, J., et V. F. Brotherus. **Botanische Ergebnisse der schwedischen Expedition nach Patagonien und dem Feuerlande 1907–1909. X. Les mousses. [Botanical results of the Swedish Expedition of 1907–1909 to Patagonia and Tierra del Fuego. X. The mosses.]** Kungl. Svenska Vetenskapsakad. Handl. 63^{10}: 1–74. *Pl. 1–4.* 1923.—This report is based on the large collections of mosses made by C. Skottsberg and T. Halle in Patagonia, Tierra del Fuego, the Falkland Islands, and the island of South Georgia. The collections were first sent to J. Cardot, who determined most of the specimens and published descriptions, prior to the war, of the 4 new monotypic genera, *Atrichopsis, Hygrodicranum, Neuroloma* and *Philibertiella.* He did not complete the work, however, and after the war did not care to resume it. It was then taken over by V. F. Brotherus, to whom in its final form the report is largely due. The collections contain 473 species, representing 95 genera and 29 families, and including 111 species and varieties proposed as new. In the list of new species and varieties, which follows, Cardot and Brotherus are the authorities for all new names unless otherwise indicated: *Amblystegium excurrens, A. tenellum, Andreaea leiophylla, A. opaca* (South Georgia), *Anoectangium patagonicum, Anomobryum laxirete, Bartramia abbreviata, B. ambigua* var. *horrida, B. leptophylla, B. leucocolea* var. *glaucoflava, B. scaberrima, Blindia praticola, B. torrentium* (Falkland Islands), *Brachythecium arenarium, B. patagonicum, Breutelia integrifolia* var. *patagonica, B. Skottsbergii* var. *horrida, Bryum anomobryoides, B. argenteum* var. *subamblyolepis* (Falkland Islands), *B. brachychaeta, B. chorizodontum, B. cochlearifolium* (South Georgia), *B. heteroblepharum* (Falkland Islands), *B. heterophyllum, B. laetevirens, B. litoralis* (Falkland Islands), *B. macrophyllum* with the new var. *latifolium* Broth. (both from the Falkland Islands), *B. malacophyllum, B. microphyllum, B. obscurum, B. orbiculatifolium, B. orthothecium, B. pseudofallax* (Falkland Islands), *B. pycnotylum, B. rhizoblastum* (Falkland Islands), *B. rimicola* (Falkland Islands), *B. rubrinerve* (Falkland Islands), *B. sabuletorum* (Falkland Islands), *B. Schleicheri* var. *patagonicum, B. Skottsbergii, B. sublamprocarpum, B. submicrolaevigatum, B. uvidum* (Falkland Islands), *B. weberoides, B. zeballosicum, Calliergoniella complanatum, Campylopus modestus* var. *deciduus* (Falkland Islands), *Catogonium politum* var. *filescens, Ceratodon purpureus* var. *falklandicus* (Falkland Islands), *Conostomum australe* vars. *microphyllum* and *piliferum, C. perangulatum* var. *majus, C. perpusillum, Dicranella flexipes, D. fuegiana, D. Hookeri* var. *flexisubulata, D. pseudorufescens* with the new var. *leptoclada, D. Skottsbergii, Dicranoloma australe* var. *condensatum* (Falkland Islands), *Dicranoweisia antarctica* var. *nigricans, D. funiculipes, Didymodon andreaeoides, Distichophyllum cavifolium* var. *montanum* Card., *Ditrichum conicum* var. *gladiciale, D. Hallei, D. homomallum* var. *leptocladum, Drepanocladus abbreviatus, D. austrostramineus* var. *tenuissima* (South Georgia), *D. fuegiensis* var. *stenophyllus* (Falkland Islands), *D. uncinatus* var. *stenocarpus, Encalypta obtusata, Eriopus apiculatus* var. *platyloma* (Falkland Islands), *Funaria cavifolia, Grimmia chabutensis, G. crassiretis, G. hyalino-cuspidata* var. *mutica, G. macrotyla, Lepyrodon lagurus* var. *laxior, L. tomentosus* vars. *minor* and *pata-*

gonicus, Meesea hymenostoma, Mielichhoferia fulvonitens, M. Skottsbergii, Mniobryum alticaule var. *crassinerve Broth., Mnium affine* var. *magellanicum, M. subpunctatum, Oligotrichum magellanicum, Orthodontium australe* vars. *brevisetum* and *sinuosifolium, Orthotrichum anaglyptodon, Philonotis litorea* (Falkland Islands), *P. vagans* var. *inundata* (South Georgia), *Plagiothecium Roeseanum* var. *falklandicum* (Falkland Islands), *Polytrichum alpinum* var. *integrifolium, Pottia austrogeorgica* var. *microphylla* (South Georgia), *P. chabutensis, P. Heimii* var. *eurystoma, Pseudodistichium austrogoergicum* var. *longifolium* Broth. (Falkland Islands), *Pseudoleskea fuegiana* var. *gracilis, P. sordidoviridis* (Falkland Islands), *Psilopilum angulatum, P. antarcticum* var. *densifolium, Pterygophyllum anomalum* var. *pallidum, Ptychomium densifolium* var. *gracile, P. horridum, Rhacomitrium Skottsbergii, Rhizogonium Novae-Hollandiae* var. *patagonicum, Rigodium hylocomioides* with the new var. *gracilius, Thuidium Dusenii* Broth., *Tortula curta, T. linguaefolia* (South Georgia), *T. litorea* (Falkland Islands), *T. stenophylla, T. subpapillosa, Webera leptoclada* (Falkland Islands), and *Weisia patagonica*. Except as otherwise noted these new species and varieties were based on material from Patagonia or Tierra del Fuego. The plate figures illustrate a large number of the new species and also *Atrichopsis magellanica, Hygrodicranum falklandicum, Neuroloma fuegianum* and *Philibertiella ditrichoidea.—A. W. Evans.*

7803. Stephani, Franz. **Species Hepaticarum.** Vol. 6. *P. 129–176.* 1918.—The early parts of this extensive work on the Hepaticae, which describes the species of the entire world, were published in the Bulletin and Memoirs of the Boissier Herbarium at Geneva and also issued separately with a different pagination. These separate issues were published in volumes with distinct title pages bearing a supplementary heading as follows: Eine Darstellung ihrer Morphologie und Beschreibung ihrer Gattungen wie aller bekannten Arten in Monographien unter Berücksichtigung ihrer gegenseitigen Verwandtschaft und geographischen Verbreitung. [A presentation of their morphology and a description in monographs of their genera, as well as of all known species, taking into consideration their relationship and geographical distribution]. Each volume was supplied also with an index. The 1st volume, 413 pages, was completed in 1900 and the 2nd, 615 pages, in 1906. When 516 pages of the 3rd volume had appeared the publication of the Bulletin was discontinued, and the later parts of the Species Hepaticarum have been published by the Boissier Herbarium as a "Complément" to the Bulletin. The 3rd volume, 693 pages in all, was completed in 1909; the 4th, 824 pages, in 1912; and the 5th, 1044 pages, in 1917. Of the 6th volume, which is supplementary to the others, 8 signatures of 16 pages each appeared in 1917, and additional signatures have since been published at rather long intervals. The 3 signatures which are here abstracted are devoted entirely to the genus *Plagiochila* and include descriptions of 155 species, distributed as follows: Europe, 1; Asia, 35; Africa, 18; Central America and the West Indies, 9; South America, 70; Pacific Islands (including Australia), 22. Some of the species designated "n.sp." have already been published elsewhere, but the following apparently appear for the 1st time, Stephani being the authority unless otherwise noted: *Plagiochila Berkeleyana* Gottsche (Nicobar Islands), *P. bicaudata* (Ecuador), *P. bidentula* (Cameroons), *P. binominata* (India), *P. borneensis* (Borneo), *P. Boschiana* (Surinam), *P. Bradeana* (Costa Rica), *P. brevisedens* (East Africa), *P. Buchtieniana* (Bolivia), *P. cacuminis* (San Thomé), *P. caledonica* (New Caledonia), *P. callaénsis* (Peru), *P. capillaris* Schiffn. (India), *P. Castellonis* Gottsche (Madeira), *P. cobana* (Ecuador), *P. colonialis* (New Caledonia), *P. conduplicata* (Japan), *P. conferta* (Jamaica), *P. confusa* (Guatemala), *P. congoana* (Ubangi), *P. consimilis* (India), *P. convoluta* (Hawaii), *P. convolutifolia* (Chile), *P. cordilliera* (Colombia), *P. cubensis* (Cuba), *P. Cumminsiana* (East Africa), *P. curvula* (New Caledonia), *P. cuspidata* (India and Birma), *P. Decolyana* (India), *P. deflexifolia* (Tasmania), *P. diacantha* Tayl. (Canary Islands), *P. diaphana* (Java), *P. dogniensis* (New Caledonia), *P. Eberhardtii* (Tonkin), *P. ecuadorensis* (Ecuador), *P. edentula* (Philippine Islands), *P. effusa* (Philippine Islands), *P. erectifolia* (New Caledonia), *P. erronea* (Java), *P. esmeraldana* (Costa Rica), *P. Etesseana* (New Caledonia), *P. excisa* (Costa Rica), *P. flagellifera* (New Caledonia), *P. flava* (Chile), *P. flavicans* (Samoa), *P. flavovirens* (India), *P. forficata* Schiffn. (India), *P. Formosae* (Formosa), *P. Francana* (New Caledonia), *P. fusco-virens* (South Africa), *P. ghatiensis* (India), *P. Goethartii* (Colombia), *P. grandifolia* (Costa Rica), *P. grata* (India),

P. Griffithiana (India), *P. grossealata* (French Guinea), *P. grossevittata* (India), *P. grossidens* (Sumatra), *P. grossispina* (Hawaii), *P. gualaquizana* (Ecuador), *P. guatemalensis* (Guatemala), *P. guayrapuriensis* (Peru), *P. Gunniana* (New Hebrides), *P. haleapalensis* (Hawaii), *P. Hans Meyeri* (Ecuador), *P. Harrisiana* (Jamaica), *P. hepaticola* (Chile), *P. heteracantha* (New Hebrides), *P. hirticaulis* (New Guinea), *P. horridula* (India), *P. humicola* (Siam), *P. Iishibana* (Japan), *P. inaequalis* (New Zealand), *P. inermis* Schiffn. (India), *P. integerrima* (West Africa), *P. integra* (Japan), *P. Irmscheri* (Colombia), *P. jurnensis* (Brazil), *P. kamerunensis* (Cameroons), *P. Kaulfussiana* (Bolivia), *P. koghiensis* (New Caledonia), *P. Kudremukti* (India), *P. kurseongensis* Schiffn. (India), *P. lacerata* (China), *P. Leratii* (New Caledonia), *P. levicalyx* (Japan), and *P. ligulifolia* (Java). Of these species *P. effusa* and *P. erronea* are homonyms, there being an earlier *P. effusa* Steph. from East Africa and an earlier *P. erronea* Steph. from tropical America.—*A. W. Evans.*

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. Fitzpatrick, *Editor*
D. S. Welch, *Assistant Editor*

(See also in this issue Entries 7544, 7548, 7834, 7854, 7857, 7860, 7865, 7866, 7902, 7976)

FUNGI

7804. Bachmann, Freda M. **An unusual growth of mold.** Bot. Gaz. 77: 111–114. *Fig. 1–3.* 1924.—The occurrence of a contorted cylindrical mass of mycelium in a bottle of grape juice is described. The mass extended through two prominent loops to the bottom of the vessel. Very slow entry of oxygen at the top made growth possible at the surface of the liquid from which point the mycelial mass was continually forced downward by new growth through the cylindrical neck of the bottle a process which resulted after a number of years in the long cylindrical mass. The mold appeared to be a species of *Aspergillus.*—*B. W. Wells.*

7805. Burk, Carl. **Über leichte und schwere Hefen.** [**Light and heavy yeasts.**] Arch. Protistenk. 46: 345–372. *34 charts.* 1923.—The author recognizes 2 types of yeasts, "flaky yeast" and "powder yeast," encountered in industrial fermentation processes. The flaky yeast settles out of the solution rather rapidly while the light, or powder yeast, remains in suspension for a much longer time. The paper summarizes various methods used in determining the rates of sedimentation of the 2 types of yeasts, as well as extensive investigations of the effects of different environmental conditions upon the specific gravity of the yeast cells. It is concluded that in cultures of yeast cells there appear, along with the normal yeasts, others which are of very low specific gravity; their appearance is dependent upon the yeast content of the culture, upon composition of the nutrient solution and upon cultural conditions. The greatest influence is exerted by the rate of multiplication, or "multiplication-energy." Physiologically, cells of lower specific gravity are the result of a lowered resistance to extreme physical and chemical conditions.—*R. P. Hall.*

7806. Davis, William Harold. **Spore germination of Ustilago striaeformis.** Phytopathology 14: 251–267. *Pl. 14–17, fig. 1.* 1924.—A study of *U. striaeformis* (Westd) Niessl was made to determine the natural conditions for spore germination, the nature of the germination, and the genus of the fungus. Spores from smutted timothy, redtop June grass and orchard grass plants which were stored outdoors or indoors, or from plants in the field or transplanted to the greenhouse, were germinated on a wide variety of media and under different conditions of air, heat, light, and moisture. The results showed that spore germination was not entirely dependent on any of these factors.—Exposure of the spores to mercuric bichloride or copper sulphate solutions of sufficient strength and length of time to disinfect them destroyed their viability. It was found that spores had an average after-ripening period (dormant period) of 250 days. This could be decreased by treatment of the spores with fumes of chloroform or with 10% citric acid solution. The average period of viability was 320 days, the germination period 20 to 30 days. The following conclusions were made:

Spores from leaves of different ages or from different pustules within a leaf vary in time of germination and length of viability. Storage in a moist atmosphere or alternate drying and moistening favor after-ripening. Low temperature delays after-ripening. The cardinal temperatures for germination of spores were, minimum 7°C., maximum 37°C., optimum 22°C.—A study of the type of germination was made to determine the taxonomic position of the fungus. Septate promycelia with lateral sporidia or primary sporidia were formed. Yeast-like budding sometimes occurs. From these characters the fungus is placed in the genus *Ustilago* and should be known as *Ustilago striaeformis* (Westd) Niessl.—*Adeline Ames.*

7807. Kanouse, Bessie Bernice. **The life-history of a new homothallic Mucor.** Papers Mich. Acad. Sci. Arts and Letters 3: 123–130. *Pl. 18–19.* 1924.—From fresh horse dung obtained near Ann Arbor a species of *Mucor* was isolated in single spore cultures. These later produced an abundance of zygospores which were formed upon lateral contact of hyphae, contact of the tip of a hypha with the side of another hypha, or upon the curvature of the tip back upon itself. The gametangia are unequal in size. Azygospores are also produced in abundance. One new single spore culture was similar in every respect to the cultures from which it was made but produced no zygospores. The fungus was compared with authentic cultures of *M. genevensis* from which it proves to be distinct, although similar in many regards. It is described as a new species, *Mucor parvispora.—Ernst A. Bessey.*

7808. Mains, E. B. **Notes on the life history of snapdragon rust, Puccinia antirrhini Diet. & Holw.** Phytopathology 14: 284–287. 1924.—The study was undertaken to get information as to whether the rust is autoecious or heteroecious, and if autoecious if it is a brachy-Puccinia or a eu-Puccinia. The observations extended over a period of 5 years. Collections of rusted snapdragons from 7 sources were used. Germination of teleutospores was obtained in 5 of these. Plants having the greatest teleutospore formation gave the most vigorous germination of teleutospores. Infection of plants with germinating spores was not obtained although the same plants were later readily infected by germinating uredospores. This indicates an alternate host. The rust did not originally occur on snapdragon. It was 1st found in California and probably originated on some native species of *Antirrhinum.* The conclusion is made that the aecial host must also be a native species.—*Adeline Ames.*

7809. Migula, W. **Kryptogamenflora von Deutschland, Deutsch-Österreich und der Schweiz. Band. III, Pilze. [Cryptogamic flora of Germany, German Austria and Switzerland. Vol. III. Fungi.]** *612 p., 90 pl., (in part col).* H. Bermühler: Berlin, 1921.—This volume describes 2996 fungi of the *Sphaeropsidales* and *Melanconiales.* To every order, family, and genus, keys are given for determination.—*J. C. Th. Uphof.*

7810. Murrill, W. A. **Fungi at Woodstock, New York.** Torreya 24: 47–48. 1924.—An exhibition of native fungi under the direction of Dr. John A. Kingsbury at Woodstock is described.—*J. C. Nelson.*

7811. Wehmeyer, Lewis E. **The imperfect stage of some higher Pyrenomycetes obtained in culture.** Papers Michigan Acad. Sci. Arts and Letters 3: 245–266. *Pl. 21–23.* 1924.—In 1921 and 1922 various forms of Pyrenomycetes were cultured by the author from single spores or single asci. Many of these developed imperfect stages. Cultures were made on various agars as well as on sterilized twigs. *Diaporthe oncostoma* (Duby) Fuck. produced pycnidia belonging to the genus *Phomopsis. Quartenaria Persoonii* (Pers.) Tul. also gave pycnidia of *Libertella faginea* Maz. *Diatrype virescens* (Schw.) Berk. produced at first acervulus-like fruiting bodies under some conditions and Tubercularia-like cushions under other conditions; sometimes cavities within the cushions also produced spores. The spores in all 3 cases were hyaline, filiform, slightly bent, 23–34 × 1–1.5μ. *Diatrypella Frostii* Peck produced extremely variable pycnidia with long, filiform, hyaline conidia, in some cases much like the imperfect forms found with *Quartenaria Persoonii. Valsaria exasperans* (Gerard) E. & E. produced many-chambered, labyrinthiform pycnidial stromata belonging to the genus *Cytosporella. Valsaria insitiva* Ces. & deNot. also produced Cytosporella pycnidial structures. *Diaporthe furfuracea* (Fr.) E. & E. produced structures assignable to the genus *Septomyxa. D. albo-velate* (B. & C.) Sacc. gave *Sporocybe Rhois* (B. & C.) Sacc.—*Ernst A. Bessey.*

LICHENS

7812. Mameli, Eva. **Licheni della Sardegna Primo contributo.** [Lichens of Sardinia.] Atti Ist. Bot. Univ. Pavia Ser. II, 17: 159–173. 1920.—Sixty three species of lichens, reported for the 1st time from the island of Sardinia, along with 17 other species previously reported, are listed with bibliographical notes.—*P. D. Caldis.*

7813. Mameli, Eva. **Licheni della Cirenaica. Secondo contributo.** [Lichens of Cirenaica.] Atti Ist. Bot. Univ. Pavia Ser. II, 17: 175–183. 1920.—Twenty-five species of lichens are listed of which 4 are new for Libia and 5 for Cirenaica, 1 is new for Libia and 1 for Africa. A bibliography and bibliographical foot-notes are appended.—*P. D. Caldis.*

BACTERIA

7814. Rivers, T. M., and Stanhope Bayne-Jones. **Influenza-like Bacilli isolated from cats.** Jour. Exp. Med. 37: 131–138. 1923.—Six strains of Gram-negative non-motile bacilli from cats have been described. They do not grow on ordinary media. They do grow, however, on a medium to which an autoclave-labile substance alone has been added as an accessory growth factor. These bacilli are similar to *Bacillus parainfluenzae* isolated from man. One strain of a Gram-negative non-motile bacillus more exacting than *B influenzae* in its food requirements was found and for convenience has been placed for the present in the parainfluenza group.—*C. S. Hoar.*

7815. Webster, Leslie T. **Intestional flora in mouse typhoid.** Jour. Exp. Med. 37: 21–32. 1923.—The normal flora of laboratory mice at the Rockefeller Institute, fed on a bread and milk diet, was determined. *Bacillus acidophilus* and *Bacillus bifidus* outnumber the *B. coli, B. acidi lactici,* and *B. coli communior* groups about 25 to 1. White and yellow cocci which do or do not liquify gelatin are occasionally noted; spirochetal and vibrio forms and yeasts are usually seen in stained preparations. The flora does not change in animals with mouse typhoid (*B. pestis caviae*) and is the same in animals which resist the infection as in those which succumb. Mice fed on meat diet and showing a colon (*B. diffluens,* and *B. Welchii*) flora do not differ in susceptibility to mouse typhoid from the normal mice fed on bread and milk and showing the *B. acidophilus* flora.—*C. S. Hoar.*

PALEOBOTANY AND EVOLUTIONARY HISTORY

Edward W. Berry, *Editor*

(See also in this issue Entries 7554, 7583)

7816. Berry, Edward W. **A fossil Celtis from Colombia.** Torreya 24: 44–46. *Figs. 1–2.* 1924.—*Celtis bolivarensis* Berry n. sp. is described. It was collected by Iddings and Beckelhymer one mile west of Pijaquay in the Dept. of Bolivar, Colombia, in marine fossiliferous deposits of the middle Eocene. This is the first fossil species of the genus from South America. The determination is based entirely on the stone.—*J. C. Nelson.*

7817. Berry, Edward W. **An Oligocene cashew nut from South America.** Amer. Jour. Sci. 8: 123–126. *Fig. 1–8.* 1924.—This describes the silicified nuts of *Anacardium peruvianum* n. sp., from the Oligocene of Peru and Colombia.—*E. W. Berry.*

7818. Berry, Edward W. **Ophioglossum hastatiforme Ckl. not an Ophioglossum.** Torreya 24: 49–50. 1924.—The fossil published under this name in Torreya 24: 10–11, 1924, is not an *Ophioglossum,* but should be referred to *Danaea coloradensis* Knowlton.—*J. C. Nelson.*

7819. Berry, Edward W. **The Mississippi Gulf in the middle and upper Eocene.** Sci. Monthly 19: 30–42. *Fig. 1–7.* 1924.—This is a popular account of the middle and upper Eocene of southeastern North America, with particular reference to the fossil plants contained in beds of these ages, restorations being given of species of *Copaifera, Citrophyllum, Sabalites, Phoenicites, Cedrela* and *Diospyros.*—*E. W. Berry.*

7820. Berry, Edward W. [Rev. of: Scott, D. H. **Extinct plants and problems of evolution.** *xiv + 240 p. 63 illus.* Macmillan & Co.: London, 1924 (see Bot. Absts. 13, Entry 7258).] Science 60: 245–246. 1924. (See also Bot. Absts. 13, Entry 7259.)

7821. Chamberlin, T. C. **Study of fundamental problems of geology.** Carnegie Inst. Washington Year Book 22: 324–334. 1924.—An old hypothesis of the author is restated. He believes that it may account for the great climatic changes that have followed one another through geologic time. At the present time the polar regions generate cold, rather highly saline waters, which creep slowly into the abyssal basins of low latitudes, there displacing warm, lighter waters, which rise and move polewards. There is thus a tendency toward the maintaining of low temperatures everywhere, for the polar influence is at present in control of the deep-sea basins. In the very warm and arid regions of the ocean highly concentrated, warm waters are generated by evaporation and these descend and spread polewards, thus opposing the refrigerating influence in the deep basins. The present contest between the 2 influences occurs in the middle and upper horizons of the ocean. The polar influence now dominates and has done so since the beginning of the Pleistocene. In earlier periods of glaciation, also, it is probable that ice-cold waters filled the abyssal depths and dominated the whole circulation. On the other hand, there were still longer periods in which warm seas seem to have prevailed in all latitudes, with the region that might generate cold waters very much restricted in area. It appears logical to conclude that high saline density generated in low latitudes then held the mastery and that the warm, dense waters creeping to the polar regions gave them the benefit of a stupendous natural water-heating system. If the evaporation influence were again to gain dominance, filling the deep-sea basins with warm waters, the warm regions of the earth would be greatly extended polewards. The present trend of the contest between the arid-regional, evaporation influence and the polar-regional cooling influence is unknown.—*B. E. Livingston.*

7822. Chaney, Ralph W. **[Researches on the fossil floras of the John Day Basin (Eastern Oregon) and other plant-fossil beds of the western United States.]** Carnegie Inst. Washington Year Book 22: 349–350. 1924.—The study is being carried on with reference to present western floras and from the ecological standpoint.—*B. E. Livingston.*

7823. Drecke, W. **Phytopaläontologie und Geologie.** *97 p.* Gebrüder Borntraeger Berlin, 1922.

7824. Fritel, P. -H. and Carrier. **Sur des vestiges de plantes devoniennes et carboniferiennes recueillies, en Ouadai, par la mission du lieutenant-colonel Gossard. [The remains of Devonian and Carboniferous plants collected in Ouadai on the expedition of Lieutenant-colonel Gossard.]** Compt. Rend. Acad. Sci. Paris 178: 505–507. 1924.—An examination of these fossils indicates the presence in the upper Devonian of *Spirophyton,* and in the Dinantien or upper Culm of *Lepidodendron* and Sphenophyllales.—*C. H. Farr.*

7825. Hay, Oliver P. **On the geological age of the Walker Hotel swamp deposit in Washington, D. C., and on the origin and the ages of the Coastal Plain terraces in general.** Jour. Washington [D. C.] Acad. Sci. 14: 255–264. 1924.—From a study and comparison of deposits and fossils from the Walker site with those of other localities, the author concludes that those of the former are much older than the Wisconsin drift and the Illinoian drift, and probably contemporary with the beginning of the Aftonian.—*Helen M. Gilkey.*

7826. Kuhlbrodt, Hans. **Über die phylogenetische Entwicklung des Spaltöffnungsapparates am Sporophyten der Moose. [Phylogenetical development of the stomata on the sporophytes of the mosses.]** Beiträge Allg. Bot. 2: 363–402. *Fig. 1–31.* 1922.—Both progressive and regressive tendencies are found among the mosses in the development of stomata on the sporophyte. In the case of the regressive developments the only satisfactory explanation is that, as with the Phanerogams, the many malformations of stomata and the large number of such malformations found, point to a previous reduction of the assimilatory system and to an increasing parasitism of the sporophyte in the later phylogenetic development.—*O. L. Clark.*

7827. Мирчинк, Г. Ф. [Mirchink, G. F.] **Послетретичная история равнины Европейской России: Геологические условия образования торФянков и значение геологии в торФяном деле. [The post-tertiary history of the plains of European Russia: geologic conditions of peat formation and the importance of geology in the study of peat.]** Работы ТорФяной Академии. [Papers of the Peat Acad.] 1: 1–23. 1920.

7828. Моисеев, A. C. [Moiseev, A. S.] **Находки растеній въ Юрскихъ отложеніяхъ окрестностей г. Ялты и Кучук-Узен-Баша.** [Jurassic plant deposits near IAlta and Kuchuk-Uzen-Bash.] **Записки Крымскаго Общества Естествоиспытателей и Любителей Природы** [Notes Crimean Soc. Nat.] 7: 52. 1917 [1920].

7829. Wieland, G. R. [Progress in palaeobotanical investigations.] Carnegie Inst. Washington Year Book 22: 353–354. 1924.—Brief attention is given to the cycadeoids. "Organically speaking, whether viewed as the result of reduction or as examples of gigantism, the flower of Cycadeoidea, especially, is of advanced type." It "is comparable to the most instead of the least specialized angiospermous flowers."—*B. E. Livingston.*

7830. Wieland, G. R. **Recent achievements in paleobotany.** Science 60: 233–235. 1924.

PATHOLOGY

Frederick V. Rand, *Editor*

Lillian C. Cash and Harry Braun, *Associate Editors*

(See also in this issue Entries 7500, 7544, 7548, 7599, 7617, 7619, 7622, 7630, 7638, 7641, 7650, 7658, 7660, 7668, 7684, 7734, 7755, 7763, 7806, 7808, 7927, 7934, 7972, 7975, 7977, 8017, 8024, 8107)

DISEASES CAUSED BY FUNGI

7831. Altona, T. **Kernrot in Tectona grandis.** [Heartrot in Tectona grandis.] Tectona 16: 456–473. *Fig. 15.* 1923.—In many plantations of *Tectona grandis* in Java a form of heartrot occurs, which is caused by wounds reaching the heart. The disease spreads downwards and also sideways. It stains the heart wood dark, healthy and diseased wood being separated by a dark band. The disease manifests itself outwardly by numerous adventive buds, by dead tops, and by the appearance of many vertical and horizontal clefts in the bark. The cause is probably a fungus.—*Ch. Coster.*

7832. Baxter, Dow V. **The heart rot of black ash caused by Polyporus hispidus Fr.** Papers Michigan Acad. Sci. Arts and Letters 3: 39–50. *Pl. 8–14, fig. 2.* 1924.—Black ash, *Fraxinus nigra* Marsh, is abundant in low, wet regions in Michigan. A heart rot caused by *Polyporus hispidus* is common throughout the state. Although reported on a number of other hosts elsewhere, it is confined to the black ash in Michigan. White ash (*Fraxinus alba*) in close proximity to diseased black ash remains free from this rot although it is often attacked by *Fomes fraxinophilus* which in its turn has never been found by the author on the black ash. The sporophores of *Polyporus hispidus* appear in the fall near branch stubs, in frost cracks or in wounds, at the upper part of the main trunk. They are usually quickly destroyed by insects and by weathering. Trees are attacked at all ages. Frequently the diseased trees are badly channeled in the basal portion by carpenter ants (*Componotus pennsylvanicus*), but it was found that a section of healthy wood separated the rot above from the ant-channeled region below, showing the independence of the rot infection and the ant injury. The rotted wood of a split log is soft and spongy and dries out faster than the healthy wood, separating concentrically from the latter. The wood elements are partially delignified and the numerous starch grains normally found in the wood disappear as the rot progresses. After the infected trees are cut, growth of the mycelium soon stops. The mycelium occurs not only in the rotted heart wood but is found also in little pockets in the midst of sound wood at some distance, even up to 6 feet, from the nearest region of general infection and rot. This region of wood, sound to the eye except for the occasional pockets, is considerably weaker under careful compression tests than wood free from all mycelium. Control methods contemplate silvicultural conditions more favorable for the growth of the black ash, as the disease is more abundant in trees growing under unfavorable conditions.—*Ernst A. Bessey.*

7833. Berkeley, G. H. and A. B. Jackson. **Strawberry black rot.** [Abstract]. Phytopathology 14: 348. 1924.

7834. Bessey, E. A. **Notes on the orange rusts of Rubus.** Papers Michigan Acad. Sci. Arts and Letters 3: 61–66. 1924.—Both the long-cycle and short-cycle forms of the orange

rusts of *Rubus* occur in Michigan. Specimens of the former have been obtained from all parts of the state, while the short-cycle rust has not yet been collected in the Upper Peninsula. Both forms have been collected on *Rubus occidentalis*, the short cycle form only on *R. procumbens*, and the long-cycle only on *R. allegheniensis*. At Oxford, Ohio, however, the short-cycle form was collected on the latter host. Only the long-cycle form has been collected on cultivated purple raspberries, probably crosses of *R. strigosus* and *R. occidentalis* (by error reported as *R. strigosus*). The spore size difference agrees with those given by Kunkel. A graph shows the distribution of the length and breadth of the spores of the different rust forms. One lot of rust, on a cultivated blackberry, gave both long- and short-cycle spores in the same sori. The spore length and width in this form were each in excess of those for either of the other forms. In general, the fine markings on the spore walls are closer together in the long-cycle form than in the short-cycle form but exceptions occur in both forms.—*Author.*

7835. Birmingham, W. A. **Black spot on dried orange peel from China.** Agric. Gaz. New South Wales 35: 345. 1924.—Dried orange peel imported from China carried viable spores of *Phoma citricarpa*. The disease has not yet been reported from Japan, America, or the Philippines.—*L. R. Waldron.*

7836. Blackman, V. H. **A report on gooseberry diseases in East Sussex, 1922–1923.** *12 p.* F. J. Parsons, Ltd.: Hastings and Lewes, 1923.—After examining the goose-berry plantations in the vicinity of Lewes and determining the fungi present on diseased canes, the author concludes that the trouble is not due to the epidemic attack of a single fungus but to the minor attacks of a group of fungi including *Nectria cinnabarina*, *Botrytis cinerea* and *Armillaria mellea*. *Armillaria* is controlled by digging up infected plants, mixing lime with the soil where they grew and leaving the ground fallow for at least a year. The cutting out and pruning of dead wood should suffice for the control of the stem type of disease.—*Lillian C. Cash.*

7837. Briosi, Giovanni. **Rassegna crittogamica per l'anno 1915, con notizie sulle malattie del frumento duvote a parassiti vegetali.** [**Cryptogamic review for the year 1915 with notes on the diseases of wheat.**] Atti Ist. Bot. Univ. Pavia Ser. II, 17: 59–80. 1920.—This is a general survey of plant diseases for the year, with descriptions of symptoms and control measures for some of the principal diseases of wheat in Italy. The following parasites caused trouble: *Peronospora* on grapes; rust, *Sphaerella Tulasnei*, *Septoria graminum* and *S. glumarum* on wheat; *Sphaerotheca pannosa* on peach; *Clasterosporium carpophilum* on peach, almond and apricot, causing shot-holes on leaves and gummosis on branches; *Fusicladium* on pear and apple, *Cycloconium* and *Stictis Panizzei* on olive; *Peronospora* on potatoes and tomatoes; *Fusarium Solani* on potatoes; *Sclerotinia libertiana* on horse beans; *Septoria Apii* on celery; *Fusarium niveum* and *Colletotrichum oligochaetum* on watermelons and melons; and *Colletotrichum Lindemuthianum* on beans.—Diseases of wheat caused by the following fungi are discussed: *Micrococcus Tritici* Prill., *Gibberella Saubinetii* (Mont.) Sacc., *Septoria glumarum* Pass., *Gibellina cerealis* Pass., *Ophiobolus graminis* Sacc., *O. herpotricus* (Fr.) Sacc., *Leptosphaeria herpotricoides* De Not., *Sphaeroderma damnosum* Sacc., *Dilophia graminis* (Fuck.) Sacc., *Erysiphe graminis* D. C., *Cladosporium herbarum* Link, *Sclerospora macrospora* Sacc., *Septoria Graminum* Desm., and *Septoria Tritici* Desm.—*P. D. Caldis.*

7838. Camp, A. F. **Citric acid as a source of carbon for certain citrus fruit-destroying fungi.** Ann. Missouri Bot. Gard. 10: 213–298. *Pl. 14, Fig. 1–21.* 1923.—Experimental data are presented in which the following fungi are involved: *Penicillium stoloniferum* Thom, *Penicillium* sp., *P. digitatum* Sacc., *Aspergillus* sp., *Diplodia natalensis* Evans, *Alternaria Citri* Pierce, *Alternaria* sp., *Phomopsis Citri* Fawcett, and *Sclerotinia Libertiana* Fuckel.—A detailed description is given of the method used for the determination of citric acid and the application of the wet combustion method for the determination of total C to physiological work. Citrates are not favorable sources of N for the fungi named above. However, citrate mixtures with a suitable active acidity, when supplied with some dextrose, were efficient sources of C for most of the organisms except *Penicillium digitatum* and *Phomopsis Citri*. After mycelium had been grown on dextrose at favorable pH, free citric acid was utilized more favorably by *Penicillium stoloniferum*, *Penicillium* sp, and *Aspergillus* sp. than by *Diplodia natalensis*, *Phomopsis Citri*, *Alternaria Citri* Pierce, *Alternaria* sp. and *Penicillium digitatum*.

Sclerotinia Libertiana was intermediate between these 2 groups. These fungi grown on dextrose and dextrose-citrate media were studied in relation to their growth, trend of pH, and utilization of dextrose and carbon. The autolytic products, acids and alcohols, were formed under unfavorable conditions of H-ion and O_2. "Tolerance or utilization of free citric acid is perhaps not an important factor in the specialized parasitism of such fungi as *Phomopsis Citri, Penicillium digitatum, Alternaria Citri, Alternaria* sp., *Sclerotinia Libertiana* and *Diplodia natalensis* but it probably is a factor in the destructive rotting of injured fruit by numerous fungi which cause this final collapse."—Under suitable environmental conditions *Penicillium stoloniferum, Penicillium* sp. and *Aspergillus* sp. would probably come in the latter category.—*S. M. Zeller.*

7839. Dickson, B. T., R. Summerby and J. G. Coulson. **Smut control experiments in hull-less oats during 1923.** [Abstract.] Phytopathology **14**: 350. 1924.

7840. Doidge, E. M. **A preliminary check list of plant diseases occurring in South Africa.** Bot. Surv. South Africa Mem. 6. *56 p.* Pretoria, 1924. This is a preliminary list compiled from records of the Division of Botany and of the various Agricultural Schools. Under the names of the various alphabetically arranged hosts the recorded diseases are listed with the cause, if this is known, and the localities in which the disease has been observed.—*Lillian C. Cash.*

7841. Faris, James A. **Factors influencing infection of Hordeum sativum by Ustilago Hordei.** Amer. Jour. Bot. **11**: 189–214. *2 pl., 7 fig.* 1924.—Seed of Hannchen barley were inoculated with smut spores and sown in constant-temperature tanks in soils of 40 and of 50% moisture content and with H-ion concentrations of 5, 6, 7 and 7.8. The seedlings were germinated at 5, 10, 15, 20, 25 and 30°C. When the coleoptile had been broken and the 1st green leaf protruded 1 cm. above it (after which it has been shown that no infection takes place), the seedlings were planted in greenhouse benches and grown to maturity. High percentages of infection were obtained over a wide range of temperatures. In seed germinated in the dryer soil, the highest infection for the more acid soils was obtained at 20°, for the more alkaline at 10° and 15°; and in the moister soils at 10° to 20° for the more acid and 10° to 15° for the more alkaline. In general, an increase in moisture gave an increase in infection in the 2 acid soils. Raising the temperature from 10° to 25° after a period of 6 days, and then gradually lowering it, induced more infection than a constant temperature. Differences in the vigor of the host had little effect on degree of infection. Races of smut from different regions and different varieties do not infect the same variety equally, and there are evidently a good many biological races and a considerable degree of physiological specialization, as indicated by both greenhouse and field experiments. The author calls attention to the importance of these facts in the problem of smut resistance in the cereals. He also emphasizes the close connection and interaction of many soil factors in determining the degree of infection.—*E. W. Sinnott.*

7842. Faull, J. H. and Irene Mounce. **Stereum sanguinolentum as the cause of "Sapin Rouge" or red heart rot of balsam.** [Abstract.] Phytopathology **14**: 349. 1924.

7843. Fraser, W. P. **"Take-all" of wheat in western Canada.** [Abstract.] Phytopathology **14**: 347. 1924.

7844. Fraser, W. P. and P. M. Simonds. **Seed treatment for smut control.** [Abstract.] Phytopathology **14**: 347. 1924.

7845. Hayes, H. K., E. C. Stakman, Fred Griffee, and J. J. Christensen. **Reactions of selfed lines of maize to Ustilago Zeae.** Phytopathology **14**: 268–280. 1924.—In 1920, seven commercial varieties and 3 selfed strains of maize were grown under conditions of an artificially produced epidemic of smut infection. At the time the corn was planted spores of *Ustilago Zeae* were mixed with manure which was spread over the soil just after the corn was up. After the plants were about 3 feet high they were sprayed about every 10 days with a water suspension of sporidia of the fungus. During each season (1921–23) seed ears were selected from infected and non-infected plants and their resistance was compared. Crosses were made between resistant strains and between resistant and more susceptible strains. Notes were made on the total percentage of infection, the point of infection, the size of the smut galls, and the yield from the various selfed strains. It was found that resistance and sus-

ceptibility were strain characteristics, apparently due to genetic factors. The point of infection was also a strain characteristic. Flint varieties seemed to be slightly more susceptible to ear infection than dent varieties. F_1 crosses between resistant strains were more resistant than either of the parents, while F_1 crosses between resistant and susceptible strains were intermediate between the parents.—*B. B. Higgins.*

7846. Höstermann und Noack. **Die Rutenkrankheit der Himbeeren.** [**Didymella disease of raspberries.**] Gartenwelt **27**: 126. 1923.—One of the dangerous diseases of the raspberry is caused by *Didymella applanata*. It causes the bark to loosen in long strips. In spring the shoots often develop badly or not at all, and the fruit rarely ripens. The fungus is noticed about the end of June and causes blue-green spots which start around a bud and extend for several cm. The fruit bodies develop the 2nd year. Little is known as to control. Twigs should be cut off and burned, and it is recommended to spray healthy plants with a 1% solution of Solbar or copper-lime. The fact that the spray often does not remain on the stem is due to its waxy covering.—*J. C. Th. Uphof.*

7847. Howitt, J. E. **Coryneum twig blight of Manitoba maple.** [Abstract.] Phytopathology **14**: 345. 1924.

7848. Howitt, J. E. **Results of experiments to prevent potato Rhizoctonia.** [Abstract.] Phytopathology **14**: 349. 1924.

7849. Johnson, O. J. **Zululand Planters' Union. President's annual address.** South African Sugar Jour. **8**: 289, 291, 293. 1924.—All sugar cane in Zululand is said to be suffering severely from striped disease.—*Nellie E. Fealy.*

7850. Kulkarni, G. S. **Resistance of sorghum to loose and covered smuts.** Phytopathology **14**: 288. 1924.—Seed of 10 varieties of sorghum were obtained from the Brooklyn Botanic Garden. Five of the varieties were reported by George M. Reed as resistant and 5 as susceptible to both *Sphacelotheca cruenta* (Kühn) Potter and *Sphacelotheca Sorghi* (Link) Clint. The seed were inoculated with spores of both smuts and planted by the author at Poona, India. Results obtained were similar to those of Reed.—*Adeline Ames.*

7851. LaRue, Carl D. **Notes on the failure of the seed crop of Hevea brasiliensis on the east coast of Sumatra.** Papers Michigan Acad. Sci. Arts and Letters **3**: 193–201. 1924.—In Java and other East Indian points the seed production of *Hevea brasiliensis* is often very large; but on the east coast of Sumatra often but a few fruits develop from a large cluster of flowers, and frequently none at all. Many flowers fall immediately after pollination and of the fruits that are set a large proportion fall in the first 6 weeks. These immature fallen fruits may appear normal except that the pedicels are frequently discolored, especially near the point of abscission. After lying on the ground, dark rotten spots appear on the fruit, with acervuli of *Gloeosporium alborubrum*. Apparently healthy fruits and inflorescences as well as fallen fruits and pedicels were cultured, and in the great majority of cases this fungus appeared. The fungus occurs in apparently normal tissue of the twigs and probably grows out from this into the pedicels, causing abscission of the flowers and fruits. Localities where Gloeosporium leaf-fall is absent show full development of fruit. It is thus recommended that breeding experiments be carried on in such localities.—*Ernst A. Bessey.*

7852. Lesley, J. W. **Fusarium wilt of tomato and its control by means of resistant varieties.** California Agric. Exp. Sta. Circ. 274. *1–6*. 1924.—Wilt disease of tomatoes (*Fusarium Lycopersici* Sacc.) inflicts serious losses on tomato fields in California. Soil of the tomato seedbeds should be free from the fungus, as infection in the seedbed is destructive to the young plants and is often the means of spreading the disease to uninfected fields. If the field is already infected, a rotation of crops is advisable. When an infected field is to be cropped to tomatoes, wilt resistant varieties should be used. In sections where Stone is not the standard variety, Norton is recommended in preference, as it is resistant to wilt and is a desirable commercial variety. Globe has also shown wilt resistance and under suitable conditions may be useful where a somewhat earlier variety for shipping is desired.—*A. R. C. Haas.*

7853. Long, W. H. **The self pruning of western yellow pine.** Phytopathology **14**: 336–337. 1924.—Dying of lower branches, or self pruning, in the western yellow pine was observed to occur where the cause could not be attributed to shading. Examination revealed the presence of *Cenangium Abietis*. This fungus starts in the twigs of the lower branches and

eventually kills them. Because of lack of moisture it does not grow beyond a height of 30 feet. The pruning of the branches is of value economically as it allows a clear growth of wood without knots.—*Adeline Ames.*

7854. Mehta, Karm Chand. **On the mode of infection and perennation of the smut of "doob" (Cynodon dactylon Pers.).** Jour. Indian Bot. Soc. 3: 243–251. *1 pl.* 1923.—*Ustilago cynodontis* P. Henn. is the only smut affecting *Cynodon dactylon* in India, and it is very abundant on this important fodder grass. The smut completely destroys the inflorescences of affected plants, and spores frequently appear at the apices of short aerial shoots as well. Roots, rhizomes, and aerial branches of infected plants show hyphae 2.5–3 μ in diameter, between and occasionally within the cells. Spores are 7–8 μ in diameter. Spores germinated in distilled water and horse dung extract produce a 4-celled promycelium, or occasionally germ tubes instead. Experiments indicate that infection takes place in the first 3 or 4 days after the seedling emerges from the grain. Attempts to secure blossom-infection failed. Perpetuation of the smut apparently depends mainly on perennation of the mycelium within the underground organs of the plant.—*Winfield Dudgeon.*

7855. Miles, Herbert W. **Bunt in wheat and its control.** Ann. Rept. Kirton Agric. Inst. 1923: 40–43. *1 fig.* 1924.—Formalin treatment gave excellent control and no impairment of germination was noted even when the seed was dried for 3 months following treatment.—*F. Weiss.*

7856. Miles, Herbert W. **Verticillium disease of potatoes.** Ann. Rept. Kirton Agric. Inst. 1923: 37–39. *1 fig.* 1924.—Data on reduction of yield resulting from infection by *Verticillium* are given.—*F. Weiss.*

7857. Neger, F. W. **Beiträge zur Biologie der Erysipheen. III. Der Parasitismus der Mehltaupilze—eine Art von geduldeter Symbiosis. [Biology of the Erysiphaceae. Parasitism of the powdery mildews—a tolerated symbiosis.]** Flora 116: 331–335. *1 fig.* 1923.—The relation of the haustorium to the host may explain conflicting statements on the extent of specialization of the Erysiphaceae with regard to the host plant. Experiments carried out in the summer and autumn of 1922 with conidia of *Erysiphe Cichoracearum, E. Polygoni* and *Sphaerotheca Humuli* on a wide range of host plants fall into 3 groups: (1) No infection—the germ tubes do not penetrate the host; (2) partial infection—indicated by browning of epidermal cells, which occurs when a haustorium penetrates but is checked in its development by the secretion from the cell of a brownish mucilaginous substance which forms a capsule around the haustorium; (3) complete infection—penetration of germ tubes with no trace of encapsulation. The increased sensitiveness of host plants produced by narcosis and also that which occurs in the autumn (complete rather than partial infection) is apparently due to a decrease in the ability of the epidermal cells to form capsules.—It is suggested that the retention of chorophyll later in the autumn in infected than in uninfected leaves indicates a form of tolerated symbiosis.—*A. G. Stokey.*

7858. Oakley, R. A. **Brown-patch investigation.** Bull. Green Section U. S. Golf. Assoc. 4: 87–92. *2 fig.* 1924.—Circular areas of turf varying in size from 4 inches to 2 feet turn brown and much of the grass is killed. The trouble is caused by *Rhizoctonia Solani.* The brown patch attacks turf of bent and fescue grasses, spreading from the original point of attack in more or less concentric circles which sometimes unite to form irregular patches. The cobweb-like growth of the fungus spreading over the grass leaves, kills or seriously injures them. The development of the mycelium is favored by hot, humid, quiet atmosphere and checked by bright sunlight and wind. The frequent application of Bordeaux mixture will control the development of mycelium but will not kill the sclerotia of the fungus. Liberal watering especially in the early morning is beneficial in keeping brown-patch in check. Topdressing lightly with a good compost, to which a little $(NH_4)_2SO_4$ or some other quick-acting nitrogenous fertilizer is added, hastens recovery of the grass.—*Lillian C. Cash.*

7859. Offner, Jules, and Roger Heim. **Sur un Pleurote des praires alpines. [A Pleurotus of the alpine prairies.]** Compt. Rend. Acad. Sci. Paris 178: 412–414. 1924.—*Pleurotus* sp. was found growing on *Laserpitium latifolium* as a host, on the high alpine prairies of Lautaret. The fungus seems to be identical with that which in Vanoise lives on *Eringium alpinum.* It was collected late in the autumn.—*C. H. Farr.*

7860. Ramsey, G. B. **Sclerotinia intermedia n. sp. a cause of decay of salsify and carrots.** Phytopathology **14**: 323–327. *Pl. 23, fig. 1–6.* 1924.—A Sclerotinia found causing decay of salsify roots (*Tragopogon porrifolius* L.) and carrots (*Daucus carota* L.) on the Chicago market is described as *S. intermedia* n. sp. The type of mycelial growth and the size of the sclerotia formed are intermediate between those of *Sclerotinia minor* and *S. Libertiana* Fuck. Successful inoculations were made into a number of hosts. The decay was similar to that produced by other species of *Sclerotinia.—Adeline Ames.*

7861. Steup, T. **Een ziekte (Aecidium cinnamomi Rac.) van den tedjo (Cinnamomum iners Bl.)** [**A disease (Aecidium cinnamomi) of the tedjo (Cinnamomum iners).**] Tectona **15**: 348–350. 1922.—In a mixed planting of 1919, nearly all the tedjo trees were diseased, and the tops of many were dead or dying. A rust was found attacking leaves, petioles, and stems. The stems were hypertrophied and the leaves killed. Specimens submitted to the Instituut voor Plantenziekten were said to be probably *A. cinnamomi* which had been once before found on this host species. A description of the fungus as found on this host is appended.—*Carl Hartley.*

7862. Stone, R. E. **Chestnut blight in Ontario.** [Abstract.] Phytopathology **14**: 345. 1924.

7863. Stone, R. E. **Root rot and blight of canning peas.** [Abstract.] Phytopathology **14**: 348. 1924.—The disease is caused by *Pythium* sp. and *Fusarium* sp., working in the soil. Some success has been attained in securing resistant strains.—*Adeline Ames.*

7864. Totten, H. R. **Development of the fruit-body of a new parasitic Rhizopogon.** Jour. Elisha Mitchell Sci. Soc. **39**: 101–109. *7 pl.* 1923.—A new fungus of the Hymenogastraceae is described and given the name of *Rhizopogon parasiticus* n. sp., though doubt is expressed as to whether it is correctly placed in the genus *Rhizopogon* or whether it belongs to an undescribed genus.—A review of the work on ectotrophic mycorhizas is given, and *R. parasiticus* is shown to form compound ectotrophic mycorhizas on the roots of *Pinus echinata* and *Pinus taeda.—R. parasiticus* gives further proof of the parasitic nature of ectotrophic mycorhiza-forming fungi, for the tissues of the pine rootlets invaded by this fungus are completely destroyed.—The fungus is unique in its sporophore, which forms a gleba in the space formerly occupied by the invaded cluster of pine rootlets.—*Author.*

7865. Turconi, Malusio. **Sopra una nuova malattia del Cacao (Theobroma cacao L.)** [**A new disease of cacao.**] Atti Ist. Bot. Univ. Pavia Ser. II, **17**: 1–8. *Pl. 1.* 1920.—Leaves of cacao plants in the greenhouse of the Botanical Gardens, Pavia, were found attacked by *Physalospora Theobromae* n.sp., *Stachylidium Theobromae* n.sp., and *Helminthosporium Theobromae* n.sp. The first symptoms on the leaves consist in an indefinite, light discoloration of the infected area which turns yellow with the progress of the disease. Finally, dry spots appear. These are roundish or oval, 1–3 cm. in diameter when in the center of the leaf or of an indefinite extent covering a large part of the leaf when they are marginal, apical or basal. Black perithecia are abundantly found in such spots. The mycelium is both intra- and intercellular. Conidia of *Helminthosporium* and *Stachylidium* are also found. Descriptions of the new species are given. The writer concludes that *Physalospora Theobromae* n.sp. must be the cause of this disease of cacao to which the other 2 conidial forms concur on account of their constant association with the diseased cacao leaves and their absence from dead leaves of other neighboring plants. Numerous bibliographical foot-notes are given.—*P. D. Caldis.*

7866. Walker, J. C. **White rot of Allium in Europe and America.** Phytopathology **14**: 315–322. *Pl. 22.* 1924.—The article is a summary of known facts regarding the white rot of onion. It includes a description of the disease and the causal organism, *Sclerotium cepivorum* Berk., and the host range and geographical distribution. The author personally made a survey of the onion and garlic regions of Europe and found the disease distributed throughout western Europe. It was destructive to onions (*Allium cepa*) and leek (*Allium porrum*) in England, to onions in Holland and to onions and garlic (*Allium sativum*) in Italy and Spain. The fungus was found to thrive best in a cool soil with medium moisture content.—*Adeline Ames.*

7867. Young, H. C. **The toxic property of sulphur.** Ann. Missouri Bot. Gard. **9**: 403–435. *Fig. 1–4.* 1922.—In this paper are reported an historical account of the fungicidal

properties of S and a discussion of the physical and chemical states in which it becomes an active fungicide. Experimental work was conducted "to study the influence of the sulphur particle and molecule on the germination of spores" of the following organisms, *Colletotrichum Gossypii*, *Sclerotinia cinerea*, *Botrytis cinerea*, *Glomerella cingulata*, *Gloeosporium venetum*, *Macrosporium Sarcinaeforme*, *Phomopsis Sojae* and *Actinomyces scabies*. Experiments are described on the toxicity of (1) flowers of S, (2) finely ground flowers of S, (3) lime-S, (4) the volatile products, (5) colloidal S, and (6) on the influence of O_2 and H_2O on the toxicity of S.—"Colloidal sulphur exists in two forms, depending upon the degree of hydration;" that with a higher degree of hydration is designated as "hydrophilic," and that with a lower degree of hydration, as "hydrophobic" colloidal sulphur.—The preparation of hydrophilic colloidal S is given in detail.—Results of experiments with the spores of the above mentioned fungi show that hydrophilic colloidal S contains a toxic property more fungicidal than do other S preparations mentioned. This active principle is said to be pentathionic acid, which exhibits fungicidal properties regardless of climatic factors. However, S preparations exhibit a toxic property only when O_2 and H_2O are present, since pentathionic acid is an oxidation product of H_2O and S. The optimum active acidity is pH 4–5.5.—*S. M. Zeller.*

7868. Zeller, S. M. **Sphaeropsis malorum and Myxosporium corticola on apple and pear in Oregon.** Phytopathology 14: 329–333. 1924.—A study was made of the Macrophoma type of fungus occurring on apples and pears in Oregon to see if it differed from the black rot fungus, *Sphaeropsis malorum* Berk., as found in the east. The fungus produces superficial cortex cankers with Macrophoma pycnidia. The spores discharged and lodged on the bark become brown and diploid. The leaf spot occurs in old neglected orchards and is of the "frog eye" type. Because of the dry climate little damage results. Black rot of the fruit occurs frequently in the fall. The same type of fruit-rot and the same growth in culture (like that of the eastern *Sphaeropsis malorum*) was obtained from cankers, leaf spots and fruit rots.—*Myxosporium corticola* Edg. occurs in the valleys of the Willamette and Rogue rivers. The infected areas are typical of those described by other workers.—*Adeline Ames.*

DISEASES CAUSED BY BACTERIA

7869. Gardner, Max W. **A native weed host for bacterial blight of bean.** Phytopathology 14: 341. 1924.—Trailing wild bean, *Strophostyles helvola* (L.) Britton, was found to be a host for *Bacterium phaseoli* E. F. S.—*Adeline Ames.*

7870. Rosen, H. R. **A bacterial disease of foxtail (Chaetochloa lutescens).** Ann. Missouri Bot. Gard. 9: 333–402. *Pl. 23–29, fig. 1.* 1922.—*Pseudomonas alboprecipitans* n.sp., with the index numeral 5322–31220–1333, is described. This organism causes a disease of yellow foxtail grass in Arkansas. It was not discovered in nature on other grasses but artificial infection was obtained on wheat, oats, rye, barley, corn, Sudan grass, millet and perennial foxtail. This disease is described as a leaf and sheath spot. A comparison of the values of H-ion concentration and Fuller's scale methods in the study of bacterial pathogens is included.—*S. M. Zeller.*

DISEASES CAUSED BY ANIMAL PARASITES (INSECTS, NEMAS, PROTOZOANS, ETC.)

7871. Goodwin, J. C., and F. A. Fenton. **Morphological studies on injury to apple caused by Ceresa bulbalis.** Phytopathology 14: 334–335. *Fig. 1–4.* 1924.—The lesions made by the oviposition of *Ceresa bulbalis* Fab. in plum, pear and apple were studied. The ovipositor of the female is inserted through the cambium layer into the wood. A layer of cork cells is formed over the sides of the incision. The adjacent strands on both sides do not unite. The cambium within the slit thus becomes isolated and continues to grow. The force exerted between this wedge of growing tissue and the tissue of the rest of the stem results in a malformation.—*Adeline Ames.*

7872. McLeod, C. H. **The pathological anatomy of tissue produced in Abies balsamea following an attack of the spruce budworm.** [Abstract.] Phytopathology 14: 345. 1924.

7873. Nicholson, W. E. **Nematode galls on Herberta adunca (Dicks.) Gray.** Rev. Bryologique 51: 19–20. 1924.—The author reviews the literature dealing with the occurrence

of nematode galls in the Bryophytes and notes their presence for the 1st time in the hepatic, *Herberta adunca*. They are now known in about 30 mosses but in only 4 hepatics. *Tylenchus Davainii* Bastian is apparently always the parasite.—*A. W. Evans.*

7874. Weiss, Harry B., and Erdman West. **Notes on the false indigo lace bug, Gelchossa heidemanni Osborn and Drake, in New Jersey (Hemip.; Tingitidae).** Entomol. News 35: 56–60. 1924.—This sucking insect occurs from Massachusetts to Arkansas and feeds upon the false indigo (*Baptisia tinctoria*). In severe infestations every leaf of the plant is whitened.—*O. A. Stevens.*

INFECTIOUS CHLOROSES (MOSAIC AND PEACH YELLOWS GROUPS, ETC.)

7875. Anonymous. **From all sources.** South African Sugar Jour. 8: 461. 1924.—Through the practice of planting maize between cane rows in Cuba the corn aphis has spread mosaic disease to an alarming degree. It has been recommended that this practice be abolished and that grasses of the heavy types, such as Guinea and Para, be carefully cleaned out.—*Nellie E. Fealy.*

7876. Anonymous. **The Natal Planters Union. Annual general meeting.** South African Sugar Jour. 8: 256–257, 259, 261, 263, 267. 1924.—It was the concensus of opinion at this meeting that Uba is the only cane free from mosaic disease. Announcement was made by [H. H.] Storey that he has an apparatus by which he can inoculate any cane with mosaic.—*Nellie E. Fealy.*

7877. Berkeley, G. H., and A. B. Jackson. **Raspberry diseases.** [Abstract.] Phytopathology 14: 347. 1924.—Mosaic and leaf curl are discussed.—*Adeline Ames.*

7878. Dickson, B. T. **Mosaic Studies IV.** [Abstract.] Phytopathology 14: 346. 1924.

7879. Ducomet, V., et E. Foex. **Note sur les maladies de la dégénerescence de la pomme de terre. [Notes on the degeneration of potatoes.]** Rev. Bot. Appl. et Agric. Coloniale 2: 325–330. 1922.—A brief summary is given of the work of English, Dutch and American workers in regard to these diseases.—*Lillian C. Cash.*

7880. Duggar, B. M., and J. K. Armstrong. **Indications respecting the nature of the infective particles in the mosaic disease of tobacco.** Ann. Missouri Bot. Gard. 10: 191–212. 1923.—In this paper are discussed some of the theories as to the nature of the causal factors and some problems relating to that type of infectious chlorosis illustrated by the mosaic disease of tobacco. A general statement concerning the symptoms of the true mosaic disease, as distinguished from other infectious chloroses, is given with special reference to the hypoplastic and hyperplastic nature of the development of chlorophyllous tissues.—The enzymic nature of the mosaic disease as postulated by Woods is discussed. The oxidizing enzyme theory might partially explain a chlorotic condition but could not explain the hyperplastic conditions which usually obtain in affected tissues. Nevertheless, Allard has quite definitely refuted the oxidase theory, since in quantitative and differential tests the destruction of oxidase does not affect the viriferous nature of infectious plant juices. Although transmission of the disease has been effected by several workers through the use of bacteria-containing juices from diseased plants, it has not been adequately demonstrated that the bacteria were more than subsequent or superficial organisms, that is, the bacterial theory is wholly unsustained. The virus theory, since there are well-known analogies in the factors of transmission in certain animal diseases, has been widely accepted, but the most favored view has been an ultramicroscopic organism. The amoeban or protozoan theory, 1st postulated by Iwanowski and Hunger who were attracted by amoeba-like bodies in the cells of diseased tissues, has been stimulated of late by the announcements by Matz, Kunkel, Palm, Dickson, Nelson and others. This work has revealed that in diseased cells peculiar bodies do appear, which are not evident in healthy tissues, but the flagellate-like bodies announced by Nelson are to be observed both in diseased and healthy tissues.—Work with a graded series of ultrafilters, previously reported by Duggar and Karrer, is reviewed. This work points to the conclusion that the infecting particles are approximately the same size as those of a fresh 1% solution of hemoglobin, that is, approximately 30 $\mu\mu$ in diameter.—The incubation period for this virus is 10 days to 2 weeks. It migrates rapidly from cell to cell and is not so sensitive to reagents, etc., as might be expected of bodies so small. Large amounts of acetone or alcohol

produced sufficient dehydration to lower the incidence of infection. It was found that while mechanical grinding would kill *Bacillus subtilis*, it was not effective in the destruction of mosaic virus. A review is made of the conditions under which mosaic and similar diseases are transmitted, and suggestive leads are given to the idea that "the mosaic virus behaves as if it were a biocolloid, yet one endowed with the power of reproduction. . . . We cannot avoid the impression, tentatively, that the causal agency in mosaic disease may be, in any particular case, a sometime product of the host cell; not a simple product such as an enzyme, but a particle of chromatin or of some structure with a definite heredity, a gene perhaps, that has, so to speak, revolted from the shackles of coordination, and being endowed with a capacity to reproduce itself, continues to produce disturbance and "stimulation" in its path, but its path is only the living cell."—*S. M. Zeller.*

7881. Elmer, O. H. **Mosaic cross-inoculation and insect transmission studies.** Science 56: 370–372. 1922.—Infections with mosaic were obtained by cross-inoculations as follows: petunia, from crookneck squash; the latter, from tomato and tobacco; tomato and tobacco, from crookneck squash; 1 of 5 tobacco plants showed infection after inoculation with cucumber mosaic; 3 out of 5 tomato plants, from catnip; cowpea, from crookneck squash, using mealy bug as transmitting agent; cowpea, from potato, using aphids; soy bean, from cowpea, using mealy bug. Cowpea was found susceptible to mosaic under greenhouse conditions. The mosaic with which the author is working is transmissible by aphids (species undetermined) and is considered inter-transmissible between species of Cucurbitaceae, Solanaceae and Leguminosae, particularly when the plants are growing under very favorable conditions.—*Harry Braun.*

7882. Miles, Herbert W. **Potato leaf curl.** Ann. Rept. Kirton Agric. Inst. 1923: 33–37. *2 fig.* 1924.—Data on reduction of yield accompanying presence of varying percentages of leafroll in the field are given.—*F. Weiss.*

7883. Tempany, H., F. S. Earle, and E. W. Brandes. **Mosaic disease in Natal.** South African Sugar Jour. 8: 269–271. 1924.—A precis of the reports of H. H. Storey, Government Mycologist, Durban, was sent in November, 1923, to the above-named men; the reply of each is given in full. Tempany believes that if the mosaic disease could be stamped out in South Africa by prohibiting the planting of any variety of sugar-cane other than Uba, such prohibition might be advisable, especially as Uba is practically the only variety now planted in South Africa. He suggests that Uba may be capable of harboring mosaic without showing its effects.—According to Earle's conclusion, mosaic was responsible for the South African planters abandoning the Cheribon and Otaheite canes and adopting Uba; and for the Argentine planters abandoning Cheribon and planting the tolerant Java hybrids, "but they did not realise what the trouble was until after our work with mosaic in Porto Rico." He believes that with a little careful work South Africa can plant any of the standard varieties with safety, and states that no sugar industry is safe that is based on but one variety. In proof of this he calls attention to the fact that Storey has found a serious new disease attacking Uba. No serious practical effects have resulted from attacks of sugar-cane mosaic on corn and some of the grasses, and the occurrence of the disease on these plants has not prevented its control by eradication methods.—It is Brandes' opinion that Cuba is threatened with an epiphytotic of cane mosaic. Florida is a notable exception to the usual inattention to sugar-cane mosaic until the disease is beyond control. The Florida State Plant Board promulgated quarantine regulations which require destruction of all diseased cane and of all healthy cane within a radius of ½ mile, and prohibit replanting of cane on the proscribed area for a year or more. As a result of the enforcement of this quarantine the disease seems to be entirely eradicated from the affected areas. Brandes has no evidence that the disease is transmitted through true seed and has never seen it on grass more than ¾ mile from infected cane. He believes that while these other grasses are susceptible to mosaic disease they are not its natural hosts and on them the disease usually will not survive. South Africa is the one country where there is hope of successfully growing varieties of cane susceptible to mosaic. This would be brought about by elimination of all diseased and preferably of all susceptible varieties also, and reintroduction of mosaic-free stock under strict quarantine regulations. Methods followed in Formosa and Japan for controlling mosaic consist in roguing out diseased

plants in the seed gardens at high elevations in the mountains and sending only healthy plants to seed gardens at low elevations, this roguing process continuing until the plantation level is reached. This method is expensive and practical only in Formosa.—*Nellie E. Fealy.*

PARASITIC PHANEROGAMS

7884. Patvardhan, G. B. **Note on Loranthus on Eucalyptus in Poona.** Jour. Indian Bot. Soc. 4: 71–72. *1 pl.* 1924.—Four *Eucalyptus rostrata* trees are reported as attacked by *Loranthus longiflorus* at Poona, India. Attack occurs before the host is old enough for the bark to begin to shed.—*Winfield Dudgeon.*

7885. Perry, W. J. **Mistletoe—the insidious enemy of trees.** Amer. Forest. 29: 748–749. *7 fig.* 1923.

NON-PARASITIC DISEASES

7886. Arrhenius, O. **Försök till bekämpande av havrens gråfläcksjuka. [Experiments in combating the gray-spot disease in oats.]** Medd. Centralanst. Försöks. Jordbr. 244. *1–19. Col. pl.* 1924; and K. Landbr. Akad. Handl. Tidskr. 62: 324–360. *Col. pl.* 1923; 63: 192–210. 1924.—This disease is increasing in severity in Holland and Sweden. It is considered to be due to soil conditions and is especially abundant in light, calcareous soils. Young leaves are spotted at the base, wither and break at the diseased place. The host may fail to fruit. Lime in excessive quantities appears to be the cause. Experiments indicate that soil reaction is not *per se* of importance, but rather an undue proportion of lime to other ions in the soil solution. Manganese sulfate and manganese chloride control the disease almost completely by providing the antagonistic manganese ion. Salts of Na (except the nitrate) and NH_4 act in the same way but to a lesser degree. Recommendations include the use of resistant varieties, care in adding lime, N fertilization with NH_4 salts instead of nitrates, the use of Mn salts, $CaCl_2$, NH_4Cl, $(NH_4)_2SO_4$, or Na_2SO_4.—*Harry Braun.*

7887. Hopkins, G. M. **Frost as a cause of unsoundness in sal.** Indian Forest. 50: 243–246. 1924.—Decay induced by frost is common in sal (*Shorea robusta*) forests, and progresses downward from point of injury to base of tree at the average rate of 7 inches a year. A large part of the best young crops are damaged seriously and many are worthless when mature. Badly damaged stands should be removed as soon as possible.—*E. N. Munns.*

7888. Rhoads, Arthur S. **Apple measles, with special reference to the comparative susceptibility and resistance of apple to the disease in Missouri.** Phytopathology 14: 289–314. *Pl. 17–21, 1 fig.* 1924.—The article summarizes the previous report of the disease in the U. S. A. and the work of the author. Due to differences in location of the pustules the disease occurs in 3 forms, the isolated pustular, the scurfy, and the canker types. It starts on fairly young growth. The cork layer thickens beneath the pustules and, as it develops, the excresences become exfoliated or they may become overgrown in the bark development and remain behind as inclusions in the cortex. Data taken from 1667 trees as to varietal resistance showed that there is a marked difference in susceptibility and resistance and that many varieties are affected in a way peculiar to the variety. Orchard management or soil treatment did not appear to be a factor in resistance. Most of the crab varieties were resistant. The author regards the disease as physiological. There was no indication of its being due to fungi, bacteria or to an excess of NO_3 in the soil. The general health of affected trees does not seem to be affected and in many cases they ultimately outgrow the disease. In only 4 instances did trees of susceptible varieties appear to be dying.—*Adeline Ames.*

GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE

7889. Anonymous. [Rev. of: Fryer, P. J. **Successful spraying and how to achieve it.** *154 p.* Ernest Benn: London, 1923 (see Bot. Absts. 13, Entry 6711).] Nature 113: 780. 1924.

7890. Agee, H. P. **Disease-resistant sugar cane types.** Australian Sugar Jour. 16: 49–53. 1924.—The recent epidemic of mosaic disease of sugar cane in Porto Rico has resulted in bringing to the fore in several sugar countries certain thick-stick, hardy canes of North Indian

origin which have been found immune to mosaic and root rot. In his list of varieties showing relative resistance to root rot F. S. Earle gives 4 as being practically immune to root disease: Kavangire, P.O.J. 36, P.O.J. 105, and P.O.J. 234. These varieties, and also P.O.J. 213 and P.O.J. 979, are described, with historic notes and notes on extension and behavior in several countries. The advantages, status, and future of Uba in different places are also briefly discussed.—*Nellie E. Fealy.*

7891. Bricout, D. **La pomme de terre.** [The potato.] *89 p., 9 fig.* J. Leherte-Courtin et fils: Renaix, 1923.—This includes a general discussion of the origin and cultivation of the potato. Diseases common in France are discussed as to symptoms and control. Particular attention is paid to the degeneration diseases and their control by the use of resistant varieties and by eradicating agents of dissemination. A discussion of current theories as to their nature is included. Methods of selection and crossing are given. Several varieties grown in France are described.—*Harry Braun.*

7892. Briosi, Giovanni. **Rassegna crittogamica per l'anno 1916, con cenno sulle malattie dei cereali, dovute a parassiti vegetali.** [Cryptogamic review for the year 1916 with notes on the diseases of cereals.] Atti. Ist. Bot. Univ. Pavia Ser. II, 17: 81–101. 1920.—This is a general survey of plant diseases for the year, with description of symptoms and control measures for the principal diseases of cereals in Italy. The author reports *Septoria graminis* and *S. Tritici* on wheat, *Ustilago Maydis* on corn, *Fusarium vasinfectum* on pimentos, *Fusarium Solani* on potatoes, *Exoascus* and *Clasterosporium* on peach, *Fusicladium* on apple and pear, *Sphaerotheca pannosa* and *Phragmidium subcorticium* on roses, *Septogloeum Mori* on mulberry, and *Oidium Quercinum* on oak.—Diseases of cereals caused by the following parasites are discussed and control measures suggested: *Sclerotinia temulenta* (Prill. et Delacr.) Sacc., *Claviceps purpurea* (Fr.) Tul., *Leptosphaeria herpotrichoides* De Not., *Dilophia graminis* (Fuck.) Sacc., *Tilletia secalis* (Corda) Kuhn. *Urocystis occulta* (Wallr.) Rabh., *Puccinia dispersa* Erik., *Puccinia glumarum* (Schm.) Erik. et Henn., *Fusarium nivale* Ces., *Ophiobolus graminis* Sacc., *Erysiphe graminis* DC. and *Melampirum arvense* L., on rye.—*Ustilago avenae* (Pers.) Jens., *U. laevis*, *Puccinia coronifera* Kleb., *Helminthosporium avenae-sativae* Briosi & Cavara, *Fusarium avenaceum* (Fr.) Sacc., *Scolecotrichum graminis* forma *avenae* on oats.—*Puccinia simplex* (Koern.) Erik & Henn., *Puccinia glumarum* (Schm.) Erik. & Henn., *Hormodendron Hordei* Bruh., *Ustilago Hordei* (Pers.) Kell. & Sw., *Ustilago nuda* Jensen, *Helminthosporium gramineum* (Rabh.) Erikss. and *H. Teres* Sacc. on barley.—*Pythium DeBaryanum* Hesse, *Ustilago maydis* (DC.) Tul., *U. Fischeri* Pass., *Sphacelotheca Reiliana* (Kühn.) Clin., *Puccinia Maydis* Ber., *Helminthosporium turcicum* Pass., *Sclerospora macrospora* Sacc., *Chromosporium Maydis* (Ces.) Sacc., *Bacillus Zeae* Burr., and *Sclerotinia libertiana* Fuck. on corn.—*P. D. Caldis.*

7893. Briosi, Giovanni. **Rassegna crittogamic per l'anno 1917, con notizie sulle malattie delle patate dovute a parassiti vegetali.** [Cryptogamic review for the year 1917 with notes on the fungous diseases of potatoes.] Atti. Ist. Bot. Univ. Pavia Ser. II, 17: 265–276. 1920. —This is a general survey of plant diseases for the year, with descriptions of symptoms and control measures for the principal diseases of potatoes in Italy.—The following parasites caused trouble: *Puccinia graminis*, *Ustilago Tritici*, *Septoria* sp., *Cladosporium herbarum* on wheat; *Claviceps purpurea* on March wheat; *Ustilago Maydis* and *Puccinia Maydis* on corn; *Peronospora Schleideni* on onions; *Phytophthora infestans*, *Fusarium solani*, on potatoes; *Colletotrichum Lindemuthianum on* beans; *Isariopsis griseola* on kidney-beans; *Septoria Apii* on celery; *Exoascus deformans* and *Clasterosporium carpophilum* on peach; *Fusicladium* on pear, apple and medlar; *Phyllosticta prunicola* on prunes; *Sphaerotheca pannosa*, *Phragmidium subcorticium* on roses; *Peronospora parasitica* on violets; *Botrytis vulgaris* on dalhias; and *Cronartium Asclepiadeum* on peonies. The mildew on oaks, *Septogloeum Mori* on mulberries, *Septoria curvata* on Robinias, and *Peronospora* on grapes were also abundant.—The following diseases of potatoes are described and control measures given: *Spongospora Solani* Brunch, *Chrysophlyctis endobiotica* Schilb., *Bacterium Solani* Bol., *Bacillus atrosepticus* Van Hall, *Bacillus caulivorus* Prill. & Del., *Fusarium Solani* (Mart.) Sacc., *Bacillus amylobacter*, *B. solaniperda* Kramer, *Pythium Equiseti* Sadeb., *Phytophthora infestans* DeBy., *Sclerotinia Libertiana* Fuck., *Rosellinia necatrix* (Hart.) Berl., *Verticillium alboatrum* Rein & Berth.,

Corticium vagum Berk., *Spondylocladium atrovirens* Harz., *Phoma solanicola* Prill. & Del., *Alternaria Solani* Sor., *Vermicularia varians* Duc., *Colletotrichum solanicolum* Ga., *Actinomyces chromogenus* and *Cuscuta epilinum* Weihe.—*P. D. Caldis.*

7894. Castleman, Philip. **Improved method of examination of sputum for tubercle bacilli.** Amer. Jour. Public Health 14: 610–612. 1924.—An improved method of examining sputum for tubercle bacilli, as used at the Boston City Health Department, is described. The claim is made that it results in more positive diagnoses and gives more bacilli per microscopic field.—*C. A. Ludwig.*

7895. C[unningham], G. H. **A report on meat moulds.** [Rev. of: Brooks, F. T., and C. G. Hansford. **Mould growths upon cold-store meat.** Dept. Sci. Ind. Res. Food Invest. Bd. Special Rept. 17. *36 p., 10 fig.* 1923.] New Zealand Jour. Sci. and Tech. 7: 18–19. 1924.

7896. Dormer, W. Cottrell. **Pests in the Mackay District.** Australian Sugar Jour. 16: 96–97, 104. 1924.—In the Mackay District, which is remarkably free from sugar-cane diseases, a few stools of D.1457 were affected by leaf stripe (*Sclerospora sacchari* Miz.) and some were suffering from mosaic disease. Knife-cut disease appeared to have been prevalent last year in D.1135 growing in Marian District. Another possible disease is what many farmers call "bunchy top." This is a crumpling and twisting of the growing leaves about the heart in such a way as to make the progress of this part of the cane very difficult. The curled leaves die and rot after a time and the cane seems to recover. This trouble is found mostly in 1900 Seedling, though Q.813 and other varieties are susceptible. It may be due to sudden breaking of a drought and consequent fast growth of the cane.—*Nellie E. Fealy.*

7897. Dormer, W. Cottrell. **Pests in the Mackay District-II.** Australian Sugar Jour. 16: 168–169, 176–177. 1924.—The belief is expressed that knife-cut disease is not carried by seed. All wounds on a single stick are on the same side, which makes the insect-carrying theory doubtful. Knife-cut is capable of severely damaging a crop both as to tonnage and sugar content. On one farm at Carmilla on which there was a plot of M.168/04 surrounded by a number of other varieties and adjoining larger blocks of H.Q.426 and M.1900, about 50% of the M.168/04 canes were affected with mosaic, while not a single stool of any of the other varieties was found to be affected.—*Nellie E. Fealy.*

7898. Drayton, F. L. **Report of plant diseases for Canada, 1923.** [Abstract.] Phytopathology 14: 346. 1924.

7899. Laveran, A., et G. Franchini. **Expériences sur les flagellés de la punaise du chou. [Flagellates of the cabbage-bug, Pentatoma ornatum.]** Bull. Soc. Path. Exotique 16: 319–323. *2 fig.* 1923.—The insects studied were obtained partly from Italy and partly from the department of Vendée, France. In the digestive tract 2 species of flagellates belonging to the genera *Herpetomonas* and *Crithidia* were discovered, sometimes in great numbers and in almost pure culture. In addition to the flagellate form, there are leishmaniform parasites, round or slightly elongated, and other forms, sometimes growing or in different stages, which contain only a single nucleus. Sometimes the body of the parasite is twisted into a spiral. In general, only about 25% of the insects examined were parasitized. Forms of *Crithidia* were found mainly in the insects from Italy.—Flagellate forms were 10–20 μ long and $1\frac{1}{2}$ μ wide, not including the flagellum. The flagellum is 4–14 μ long. Small spherical forms were 1–2 μ in diameter; oval, 2–5 μ long and $1\frac{1}{2}$–2 μ wide.—The flagellates when inoculated into the peritoneum of young white mice may cause very mild infection. In 1 case only, a culture composed of round or oval parasites was obtained from the heart blood of a mouse. However, these parasites did not develop into elongated or flagellate forms.—*Lillian C. Cash.*

7900. McCallum, A. W. **Some problems in forest pathology.** [Abstract.] Phytopathology 14: 345. 1924.—The author discusses the age to which balsam may be left without loss from decay.—*Adeline Ames.*

7901. McRae, W. **Report of the Imperial Mycologist.** Sci. Rept. Agric. Res. Inst. Pusa 1922–1923: 53–60. 1923.—Studies are reported on *Piricularia* on various cereals and grasses; an undetermined sclerotial fungus on rice, *Tolyposporium penicillariae* on *Pennisetum typhoideum; Helminthosporium* on cereals, especially as the possible cause of root rot of wheat; the influence of fertilizers on the incidence of disease in jute; *Pythium* on Cucurbitaceae; and *Fusarium udum* on *Cajanus indicus.* Plots of *Cajanus* treated with superphosphate produced

a significantly large number of wilted plants, while a green-manured plot produced a significantly small number. The program of work for 1923–24 is given.—*Winfield Dudgeon.*

7902. Mallman, W. L. **Hygiene of wrestling mats.** Amer. Jour. Public Health 14: 569–570. 1924.—Owing to outbreaks of skin diseases among students using the gymnasium at the Michigan Agricultural College an investigation of the bacterial flora of the wrestling mats was made, followed by experiments in disinfection. Fifty-three organisms were isolated, including streptococci, staphylococci, micrococci, colon bacilli, and spore-forming rods. The last 2 made up most of the colonies isolated. Disinfection was tried by spraying 40% aqueous formaldehyde on the mat, rolling it tightly, and leaving it over night. By this treatment the number of organisms which could be isolated from the mat was very greatly reduced. The colonies isolated after treatment were usually spore-forming rods.—*C. A. Ludwig.*

7903. Murray, J. C. **Southern field assistant's report.** Australian Sugar Jour. 16: 95–96. 1924.—According to the report, a certain amount of leaf disease of sugar cane is in evidence in the Childers District, showing principally on H.Q.77 and Black Innis, and to a small extent on M.1900 Seedling. The leaf hopper is present in abundance and it is thought it may be to some extent the cause of spread of this disease.—*Nellie E. Fealy.*

7904. Phillips, E. F., and A. P. Sturtevant. **The diseases of adult bees in America.** Bee World 5: 171–173. 1924.—This is a discussion of the diseases of adult honeybees which are known to occur in the U. S. A. together with a list of those recorded in other countries which have not been found in the U. S. A. The prohibition against the importation of adult honeybees made in the law approved August 31, 1922, and its bearing on the interchange of breeding stock are discussed.—*E. F. Phillips.*

7905. Pollacci, Gino. **Rassegna crittogamica per gli anni 1918–1919, con brevi notizie sulle malattie del pomodoro dovute a parassiti vegetali e mezzi per combatterle.** [Cryptogamic review for the years 1918 and 1919 with brief notes on the parasitic diseases of tomatoes and their control.] Atti Ist. Bot. Univ. Pavia Ser. II, 17: 277–284. 1920.—This is a general survey of plant diseases in Italy for the years 1918 and 1919. Peaches were injured by *Ascospora Beijerinckii* Vaill. in Lombardy on account of the humidity in 1918. *Exoascus deformans* and *Sclerotinia cinerea* also affected peaches. Scab injured apples and pears, and sootmold the lemon. Rusts and smuts attacked cereals in 1918 but on account of the dryness the attack was not as severe in 1919. Potatoes and tomatoes were injured by *Phytophthora infestans*, beans by anthracnose, celery by *Septoria*, azaleas by *Exobasidium discoideum* Ellis, roses by rust, oaks by mildew and mulberries by *Septogloeum Mori*.—The following diseases of tomatoes in Italy are described and directions for control given: stem canker (*Bacillus caulivorus* Prill. & Del.); bacteriosis of the fruit (*Bact. Briosii* Pavar.); blight (*Phytophthora infestans* DeBy.), powdery mildew (*Erysiphe Polygoni* D. C.), rot of fruit (*Phoma destructiva* Plowr.); leaf diseases (*Ascochyta Hortorum* (Speg.) Smith, *Septoria Lycopersici* Speg. var. *europaea* Br. & Cav.); scab (*Cladosporium fulvum* Cooke); early blight (*Alternaria Solani* Sor.); and wilt, (*Aplanobacter michiganense* Smith.).—*P. D. Caldis.*

7906. Pollacci, Gino. **Rassegna crittogamica per l'anno 1920.** [Cryptogamic review for the year 1920.] Atti. Ist. Bot. Univ. Pavia Ser. II, 17: 285–288. 1920.—This is a general survey of plant diseases in Italy for the year 1920. Gummosis of the peach caused by *Clasterosporium* was prevalent in the spring. *Exoascus* killed young peach trees. *Sclerotinia cinerea*, and *S. fructigena* on peach; *Fusicladium dendriticum*, and *Exoascus Pruni* on apple; and *Sclerotinia Linhartiana* on quince also caused injuries. *Oidium Quercinum* developed with great severity on oaks and chestnut, *Sphaerotheca pannosa* on peach, *Podosphaera leucotricha* on apple. Potatoes and tomatoes were injured by *Peronospora*, beans by *Colletotrichum* and celery by *Septoria*. Tomato fruits were rotted by *Bacterium Briosii*. In Liguria, tomatoes were severely attacked by *Cladosporium fulvum* var. *violaceum*. Weather conditions were favorable for the development of *Puccinia* on wheat and of *Cladosporium herbarum* on cereals. Roses were injured by *Phragmidium*, *Oidium* and *Botrytis*, azaleas by *Exobasidium discoideum*, mulberries by *Fusarium lateritium*, poplars by *Melampsora Populina* and sycamores by *Gloeosporium nervisequum*.—*P. D. Caldis.*

7907. Reed, Guilford B. **A bakery infection with Monilia sitophila.** [Abstract.] Phytopathology 14: 346. 1924.

7908. Schipper. **Kolloidaler Schwefel in der gärtnerischen Praxis.** [Colloidal sulphur in horticultural practice.] Gartenwelt 27: 14–15. 1923.—The use of colloidal S in greenhouses in which grape vine and peach are grown is an advantage over ordinary S which is often harmful to man.—*J. C. Th. Uphof.*

7909. Spaulding, Perley. [Rev. of: Ideta, Arata. **Supplement to Handbook of Diseases in Japan. Vol. 1.** *398 p. illus.* 1923.] Phytopathology 14: 341. 1924.—This is a brief review of the book, which is printed in Japanese except for some citations and names of parasites. The illustrations are good.—*Adeline Ames.*

7910. Tubeuf, von. [Rev. of: Morstatt, H. **Einführung in die Pflanzenpathologie.** (Introduction to plant pathology.) *viii + 159 p.* Gebr. Borntraeger: Berlin, 1923 (see Bot. Absts. 13, Entry 1971).] Forstwiss. Centralbl. 46: 43–44. 1924.—The author attempts to cover a wide field in too brief a space, consequently his book is altogether inadequate as a text book or as an introduction to the subject. [See also Bot. Absts. 13, Entry 6094.]—*W. N. Sparhawk.*

7911. Walker, J. C. **Resistant varieties and disease-free seed save cabbage industry.** Wisconsin Horticulturalist 14: 117–118, 122. *2 fig.* 1924.—In order to obtain a large crop of seed resistant to yellows, seed from cabbage plants remaining healthy when grown on yellows-infected soil in Wisconsin are grown in the Puget Sound cabbage section for seed production the 2nd year following. The climatic conditions of this region are so unfavorable to the development of black-rot and black-leg, which are seed-borne, that such seed are now practically free from these diseases, in addition to being resistant to yellows.—*Lillian C. Cash.*

7912. Westerdijk, Johanna. **Relations between horticulture and plant pathology.** Overdruk uit het verslag van het internationaal tuinbouw-congres te Amsterdam, 17–23 September, 1923. [Reprint from: Rept. International Hort. Congress, Amsterdam, Sept. 17–23, 1923.] *11 p.* [1924?]—This is a general discussion of plant disease problems of the horticulturist and the present status of their solution. The author emphasizes the necessity of determining the actual role of seeds and bulbs as carriers in doubtful cases, before seed treatments are tried. Other topics discussed are soil sterilization, immune varieties, mildews of ornamentals, genetics as related to pathology, mosaics, and physiological diseases.—*Harry Braun.*

7913. Whitcomb, W. D. **Relation of growth of apples to cover sprays.** Proc. Washington State Hort. Assoc. 18: 5–7. 1922 [1923].—Proper dates for spraying are dependent upon the stages of development of the codling moth. Experiments to determine the rate of growth of apples have brought out some interesting points regarding the efficiency of cover sprays in protecting the fruit.—The average growth of 100 Rome Beauty apples at Yakima was found by measuring them every 7 days during the summer with self-registering calipers, and computing the surface area. The increase in area to be protected by the poison between the 1st and 2nd sprays was 387%. Much of the heavy codling moth infestation is due to a slight delay in the application of the 2nd cover spray.—*Lillian C. Cash.*

7914. Wolf, Frederick A. **Report of the Division of Plant Pathology.** Ann. Rept. North Carolina Agric. Exp. Sta. 46: 91–93. 1923.—A formal statement is given of investigations on tobacco wildfire, bacterial leafspot of clover, pod and stem blight of soybean, soybean mildew, strawberry leaf scorch, take-all of wheat, and anthracnose of dewberries.—*Author.*

PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

Heber W. Youngken, *Editor*

E. N. Gathercoal, *Assistant Editor*

(See also in this issue Entries 7535, 7614, 7695, 7755)

7915. Anonymous. **Malay poisons and charm cures.** [Rev. of: Gimlette, John D. **Malay poisons and charm cures.** 2nd ed., xii + 260 p. J. & A. Churchill: London, 1923.] Kew Bull. 1922: 352. 1922.

7916. Alexander, M. E. **Observations on the anaphylactogenic properties of rye pollen (Secale cereale.)** Jour. Immunology 8: 457–467. 1923.—The author first presents a brief history of the development of knowledge on the relationship of pollen to hay fever. His paper is based on observations made upon 20 guinea-pigs. Pollen was extracted with a 2% solution of sodium bicarbonate. It is shown that the guinea-pig can be readily made hypersensitive to rye pollen. Injected animals also show anti-anaphylaxis and specificity. Specific precipitins and complement fixing bodies were not demonstrated in animals injected with rye pollen.—*C. S. Hoar.*

7917. Aston, B. C. **The parsnip as a poisonous plant.** New Zealand Jour. Sci. and Tech. 7: 61–62. 1924.—The paper records poisoning from gathering parsnip seed at a New Zealand seed-farm. The symptoms are: a slight rash, followed by water-blisters which leave patches persisting for 1–2 years. Some workers were affected more than others, but no serious after-effects were observed.—*H. H. Allan.*

7918. Belschner, H. G. **A disease survey. Canonba pastures protection district, 1922–1923.** Agric. Gaz. New South Wales 35: 343–345. 1924.—Approximately 3% of 3000 sheep were affected by what was evidently trefoil dermatitis, perhaps brought on by pasturing where *Medicago denticulata* was found. In the cyanogenetic plants, *Heterodendron oleaefolium* and *Eremophila maculata*, hydrocyanic acid was found at the maximum from March to May after which the acid content declined.—*L. R. Waldron.*

7919. Rock, J. F. **Hunting the Chaulmoogra Tree.** Nation. Geog. Mag. 41: 243–276. *40 illus.* 1922.—Experiences are recounted in the search in southern Asia for the Chaulmoogra tree for introduction into Hawaii and our tropical possessions. The purpose of such introduction is to obtain the oil for medicinal purposes.—*W. M. Atwood.*

7920. Wächter, W. **Arzneipflanzen im Gartenbetrieb.** [Medicinal plants in horticulture.] Gartenwelt 27: 37–39. 1923.—The advantages and disadvantages of selling, growing and curing medicinal plants in Germany are discussed from a general standpoint. Growers are advised to become members of organizations through which they may come in touch with advisers and purchasers.—*J. C. Th. Uphof.*

PHYSIOLOGY

B. M. Duggar, *Editor*

W. J. Robbins, *Assistant Editor*

(See also in this issue entries 7517, 7527, 7547, 7553, 7638, 7679, 7805, 7806, 7814, 7838, 7841, 7861, 7868, 7902, 8030, 8031, 8032, 8033, 8059, 8060, 8061, 8062)

GENERAL

7921. **Ивановскій, Д. І.** [Ivanovskii, D. I.] **Физиология растеній.** [Plant physiology.] *618 p., 170 fig.* **Харьковъ-Ростовъ на Дону** [Kharkov-Rostov-on-the-Don], 1917–1919.—With the historical method as a basis for all discussions, the 1st part of the book under the general heading of "The synthesis of organic substances" takes up the following subjects: The synthesis of triple combinations (photosynthesis and chemosynthesis), absorption of minerals, absorption of N and the movement of substances in plants (transpiration and movement of water in the stem). The 2nd part under the general heading of "Absorption of organic substances" discusses the growth of seeds, absorption by lower organisms, fermentation and respiration. The 3rd and last part of the book entitled "The phenomenon of growth and movement" takes up the subjects of plant growth, the bending of growing organs (tropisms) and plant movements.—*A. J. Bruman.*

7922. Lasseur, Ph., et F. Girardet. **L'eau pure en biologie.** [Pure water in biology.] Bull. Soc. Chim. Biol. 6: 314–325. 1924.—Water can be considered sufficiently pure for use in serological and bacteriological work only when shown to be pure by physico-chemical methods. Ordinary redistillation from glass may considerably increase the content of electrolytes, and the same result may follow the use of non-resistant glassware for storage or

cultural work. A water of conductivity $K = 1.4 \times 10^{-6}$ was placed in glass vessels of various makes, previously washed in the same water, and autoclaved 20 minutes at 120°, after which the conductivity was determined. The results ranged from $K = 1.4 \times 10^{-6}$ for a Pyrex flask to $K = 130 \times 10^{-6}$ for a Chamberland pipette and $K = 160 \times 10^{-6}$ for test tubes of American make. With a distilling apparatus of tin devised by Girardet it is possible to make a water of conductivity $K = 1 \times 10^{-6}$.—*Joseph S. Caldwell.*

7923. Showalter, William Joseph. **Exploring the mysteries of plant life.** Nation. Geog. Mag. **45:** 581–646. *16 col. pl., 41 illus.* 1924.—This is a popular description of the functions and life habits of plants, with simple structural explanations. The article closes with popular descriptions of 47 common wild flowers. The topics discussed include plant diversity, reproductive habits, means of dissemination, cell constitution and behavior, photosynthesis, absorption, transpiration, insectivorous plants, parasitism, and plant evolution. —*W. M. Atwood.*

PROTOPLASM, MOTILITY

7924. Metzner, Paul. **Studien über die Bewegungsmechanik der Spermatozoiden. [Mechanics of movement of spermatozoa.]** Beiträge Allg. Bot. **2:** 435–500. *Fig. 1–14.* 1922.

7925. Riemsdyk, M. van. **Über die Beweglichkeit der Anaerobenbakterien und ein neues Verfahren, diese einfach darzustellen. [Motility of anaerobic bacteria and a new simple method of demonstration.]** Zeitschr. Hygiene u. Infecktionskrankh. **96:** 167–171. *2 fig.* 1922.—A few drops of pyrogallol and KOH were used in the bottom of a modified hanging drop chamber for observing cultures under anaerobic conditions. Most of the anaerobic bacteria were more motile in the anaerobic hanging drop. *Bacillus butyricus* was more active in the aerobic preparation.—*W. H. Chambers.*

7926. Seidel, Kurt. **Versuche über die Reizleitung bei Mimosa pudica. [Conduction of stimuli in Mimosa pudica.]** Beiträge Allg. Bot. **2:** 557–575. 1923.—These experiments were carried out to test, under European conditions, the conclusions of Riccia that (1) The conduction of stimuli was through the wood in connection with the passage of water and not in the cortex. (2) The conduction of stimuli is not caused by variations in pressure. (3) There is a specific substance arising after stimulation which diffuses by means of the transpiration current to the leaf bases in question, where the reaction occurs. The experiments confirm the observations of Riccia but Seidel concludes that there is a conduction of stimulus, as pointed out by Haberlandt, by way of the companion cells with accompanying change in pressure in them, as well as a 2nd type of conduction due to a substance contained in the cell sap. The 1st type may be called mechanical and the latter physiological conduction of a stimulus.—*Orton L. Clark.*

DIFFUSION, PERMEABILITY, PHYSICO-CHEMICAL PHENOMENA

7927. Braun, Harry. **A gradient of permeability to iodin in wheat seed coats.** Jour. Agric. Res. **28:** 225–226. 1924.—Studies on the entry of I into wheat seed point to the following conclusions: (1) There is very little spread of I under the seedcoats from the embryo end either laterally or distally; (2) entry takes place over the entire surface, radially but not uniformly; (3) the *apparent* lateral and distal spread from the embryo end is due to the existence of a gradient of permeability to I in the seed coats. The permeability is greatest near the embryo end, diminishes to a minimum near the distal end and again increases slightly. This is contrary to prevailing views holding that I spreads through the embryo end under the seedcoats, but is supported by experiments with paraffin-coated seed which showed that: (1) When the embryo end only is exposed, I penetrates only as far as the limits of the exposed area and fails to spread much further distally or laterally under the paraffin-protected seedcoats; (2) when the embryo end alone is coated, I entry manifests itself progressively, beginning on the exposed part of the curved surface, nearest the embryo end, and continuing in a lateral and distal direction; the I-blackening at any point on such a grain corresponds in degree with that shown after a similar period of time on the same point of an unprotected grain.—The failure of I to spread rapidly laterally and inwardly is due to its removal by the

starch nearest the points of entry, while H_2O goes on through; this is corroborated by experiments with dry starch gels.—A cytological basis for the permeability gradient was found in both immature and mature seed, in a greater degree of cutinization of the cutin layer in a direction opposite to the degree of permeability to I.—*Author.*

7928. Fujii, Nobuzo. **Studies on physico-chemical properties of phospholipin II. The effect of the presence of albumin on the physico-chemical properties of lecithin.** Jour. Biochem. Tokyo 3: 393–406. 1924.—The effect of albumin upon the transfer of lecithin from water into ether was studied. Glyceric acid prepared by a method of the author's devising was used as a buffer, since it is very slightly soluble in ether and is a stronger acid than acetic or lactic. Albumin or salts such as NaCl, $CaCl_2$, and Na_2SO_4 which are highly hydrated in H_2O solution increase the transfer of lecithin into ether by producing dehydration of the lecithin. The effect of salt and albumin is not additive, and both together may retard the transfer, probably by formation of a salt of albumin. The addition of albumin broadens the range at which transfer of lecithin occurs on the alkaline side of the isoelectric point (pH = 2.7) due to the greater dissociation and consequently greater hydration of albumins on the alkaline side.—*Joseph S. Caldwell.*

WATER RELATIONS

7929. Shreve, Edith B. **Factors governing seasonal changes in transpiration of Encelia farinosa.** Bot. Gaz. 77: 432–439. 1924.—Though the evaporating power of the air in the habitat (southern Arizona) of *E. farinosa* is twice as great during May and June as during the humid months of January and February, this plant transpires only 1.4 times as much water per unit area in the latter months as during the former. It develops 2 types of leaves, a mesophytic type in the cool moist period and a xerophytic type in the arid season. Differences in structure of the 2 types of leaves do not account for the greater resistance to water loss in the dry season. When disks of equal areas are cut from the 2 types of leaves immediately before sunrise and placed under identical external conditions, the H_2O loss from them is found to vary inversely with the total imbibitional capacity and directly with the original water content. Even though the external temperature varies as much as 10°F., the expression $E_d\ E_a \times M/O$ gives a value which approaches a constant (E_d = H_2O loss per hour by leaf disks; E_a = H_2O loss per hour by atmometer; O = original H_2O in 18 disks; M = Maximum H_2O in 18 disks). The total imbibitional capacity of both types of leaves varies with the original water content and the dry weight. The lower the original H_2O content the greater the amount of soluble material that diffuses into the H_2O which surrounds imbibing disks. The dry weights after imbibition have 1 constant value for mesophytic and another for xerophytic leaves. The ratio of evaporation to soil moisture affects the H_2O content of the leaf tissue; this in turn affects the imbibitional capacity and resistance to H_2O loss of leaf tissue. The changes in imbibitional capacity are accompanied by changes in the amount of soluble material in the tissue. These changes in diffusible material are presumably the resultants of reversible chemical changes which take up or give up H_2O according to the amount available.—*B. W. Wells.*

MINERAL NUTRIENTS AND SALT RELATIONS

7930. Crist, John W., and J. E. Weaver. **Absorption of nutrients from subsoil in relation to crop yield.** Bot. Gaz. 77: 121–148. *9 fig.* 1924.—In containers 22 inches in diameter and 30 inches deep, sunk in trenches, subsoil layers were isolated by thin wax partitions which were readily penetrated by roots. $NaNO_3$ and $CaH_4(PO_4)_2$ were variously used in fertilizing the isolated layers. Barley roots in the controls reached a depth of 30 inches, but NO_3 fertilizer at any level lessened root depth and greatly increased branching. PO_4 did not noticeably increase root development. Nutrients were absorbed in large quantities at every level to 30 inches. Although the plants used the largest amount of salts from the surface foot, they also took large additional quantities from the deeper levels when it was available. Absorption of nutrients at levels below the surface foot affected materially the quantity and quality of the yield. It does not lose its additive effect even when the surface foot is abundantly

supplied with a similar nutrient. Thus, the chemical composition of the subsoil and the soil solution is very important. NO_3 increased the total dry weight when applied to the surface foot early in the life of the plant, this result following from its effectiveness in promoting heavier tillering. It increased dry weight and also quality of grain still more when available at lower levels as well as in the surface foot. P depressed the yield, particularly that of the straw, somewhat in proportion to the amount absorbed. Time of absorption was an important factor. The effects of the nutritive salts were most marked on both quantity and quality of yield early and late in the development of the plant, that is, when absorption was confined largely to the 1st foot of soil and the crop was tillering, and again when the younger portions of the longer roots were absorbing from the deeper levels at the time of heading. Thus an ample distribution of the deeper portion of the root system in a rich subsoil solution at the later critical period of growth is exceedingly important. Consequently, a knowledge of the development and extent of the roots of crop plants is of primary interest. These experiments show the importance of the subsoil as a source of nutrients for crops, and the effects upon plant development. They emphasize the values to be gained by fertilizer practices which take the composition of the subsoil into account.—*B. W. Wells.*

7931. Hoagland, D. R. **The absorption of ions by plants.** Soil Sci. 16: 225–246. *2 fig.* 1923.—The absorption of ions by barley plants, generally over very brief periods, was determined for solutions of single salts, simple mixtures of salts, and complete nutrient solutions. The slowly absorbed SO_4 ion decreased the rate of absorption of associated cations. The presence of a relatively high concentration of Na decreased the rate of absorption of other cations, particularly K and Ca. During a given period the proportion absorbed from the total quantity of easily absorbable ions present decreased as the concentration of the ions in the solution decreased. K, NO_3, and PO_4 may be removed less rapidly than H_2O. Light affects the absorption of ions. Energy changes are involved in the processes of absorption. Permeability relations alone are inadequate to explain these phenomena in the living plant.—*W. J. Robbins.*

7932. Hoagland, D. R., and J. C. Martin. **A comparison of sand and solution cultures with soils as media for plant growth.** Soil Sci. 16: 367-388. 1923.—A comparison of the growth and composition of barley in nutrient solutions and in a fertile soil showed that the yield from solution cultures of very different composition may be greater than that from plants grown in the soil, but a distinctly different chemical composition may result. In a nutrient solution and in sand moistened with the same quantity and kind of solution the growth was greater in the sand cultures. In culture solutions in which the PO_4 was kept constant, very good growth of barley plants occurred in concentrations of PO_4 as low as those found in the soil solution. Solutions containing 1.1 parts per million PO_4 produced as good plants as fertile soil.—*W. J. Robbins.*

7933. Lomanitz, S. **A preliminary study of the effects of sodium chloride upon alfalfa grown in solution cultures.** Soil Sci. 16: 183–193. *Pl. 1, 3 fig.* 1923.—Alfalfa was grown for 98 days in a mineral nutrient solution of total concentration in terms of osmotic pressure of 1 At and in the same solution in which a part of the salts was replaced by different amounts of NaCl. The solutions containing NaCl gave greater yields in all cases, the roots showing a greater relative increase than the tops. The N content of the plants was unaffected, but the Cl content increased with the increase of that element in the solution. The acid reaction of the solutions used was changed by the plants towards neutrality.—*W. J. Robbins.*

7934. McGeorge, W. T. **The chlorosis of pineapple plants grown on manganiferous soils.** Soil Sci. 16: 269–274. 1923.—From general observations, determinations of the reactions of soils, solubility of CaO and Fe and from the literature it is concluded that the chlorosis of pineapple leaves on plants grown in manganese soils is due to a greater assimilation of lime, indirectly caused by the presence of excessive Mn in the soil. The excessive lime content of the leaves results in greater immobility of Fe in the plant.—*W. J. Robbins.*

7935. McHargue, J. S. **Convenient supports for plants in pot or water culture experiments.** Soil Sci. 16: 359–361. *Pl. 1, 1 fig.* 1923.—A perforated jar cover and metal socket for plant supports is described.—*W. J. Robbins.*

7936. Reed, H. S., and A. R. C. Haas. **Iron supply in a nutrient medium.** Bot. Gaz. 77: 290–299. 1924.—These experiments were planned to show the factors involved in Fe reduction. It was found at the end of 8 days that sand had reduced the amount of Fe in Hoagland's solution. However, the rate at which Fe disappeared from solution in flasks containing $NaHCO_3$ seems to be independent of the presence of sand. The Fe of ferric tartrate soon becomes converted into insoluble compounds when added to nutrient solutions and the change is more rapid in solutions of higher pH. The authors further note that the introduction of CO_2 lowers the pH of slightly acid, neutral, or alkaline solutions, but does not increase the solubility of Fe compounds which they contain. The addition of certain organic compounds to an alkaline nutrient solution increases the amount of soluble Fe in the solution. This fact may be of significance in maintaining an adequate supply of soluble Fe in solutions for the growth of plants.—*B. W. Wells.*

7937. Trelease, Sam F., and Helen M. Trelease. **Relation of seed weight to growth and variability of wheat in water cultures.** Bot. Gaz. 77: 199–211. 1924.—Using a pure line of Marquis wheat the experiments proved that the yields of both tops and roots were directly related to original seed weight. Selection for uniform weight was thus found to give uniformity in weight and height of the plants grown from such seed. Although the yields from heavier seed were higher than from lighter seed, the differences in yields were relatively smaller than the differences in seed weight; greater seed weight did not result in a correspondingly greater yield. Thus, per unit of seed weight, the growth rate was higher in plants from lighter seed than it was in those from heavier seed. The value in water culture technique of using seed that are nearly uniform in original weight is emphasized; such seed selection may make it possible to secure reliable results with a much smaller number of plants in each culture than would be required without such selection.—*B. W. Wells.*

7938. Wilson, Benjamin D. **The effect of plants on the concentration of drainage water from the Cornell lysimeters.** Soil Sci. 16: 427–432. 1923.—The concentration of leachings from planted and unplanted lysimeters over a period of 3 years is presented. The concentration of drainage H_2O from bare soil was higher than that from planted soil. The point of lowest concentration each year for bare soil percolates was greater than the highest for soil planted to a crop rotation. The concentrations of percolates from planted soil do not become higher relative to the bare soil after removal of the crop. The concentrations of the percolates were more or less independent of the amount of H_2O passing through the soil. The concentration of the percolates decreased each year from the month of May.—*W. J. Robbins.*

PHOTOSYNTHESIS

7939. Briggs, G. E. **Experimental researches on vegetable assimilation and respiration. XV. The development of photosynthetic activity during germination of different types of seeds.** Proc. Roy. Soc. London B, 94: 12–19. 1922.—Seedlings whose 1st photosynthetic region is also a food storage organ, as in *Helianthus*, *Cucurbita* and *Acer*, show a prompt development of photosynthetic power. This is in contrast to the slow development of photosynthetic power shown by such plants as *Phaseolus*, *Ricinus* and *Zea* where food is not so stored. Evidence is given to show that the gradual increase of photosynthesis in plants of the latter class is concerned with the mechanism of the "dark" or chemical phase of photosynthesis, and the conclusion is drawn that this mechanism must be in some way affected by the presence or absence of food in the photosynthetic organ.—*P. B. Sears.*

7940. Briggs, G. E. **Experimental researches on vegetable assimilation and respiration. XVI. The characteristics of abnormal photosynthetic activity resulting from deficiency of nutrient salts.** Proc. Roy. Soc. London B, 94: 20–35. 1922.–Leaves of Phaseolus seedlings grown in culture solutions lacking Fe, Mg, K, or P show subnormal photosynthetic activity as compared with plants grown in complete nutrient solutions. This is true whether temperature, light, or (probably) CO_2 be limiting factors. The hypothesis is put forward that such subnormal performance is due to a lesser "reactive chloroplast surface" in the improperly nourished plants.—*P. B. Sears.*

7941. Pollacci, Gino. **Sul carbonio delle piante verdi.** [The carbon of green plants.] Atti Ist. Bot. Univ. Pavia. Ser. II, 17: 29–51. *Fig. 1–2.* 1920.—Seedlings grown in an atmosphere free of CO_2, under carefully controlled conditions in a soil rich in humus or in a nutrient solution containing CO_2, lived and formed starch. Seedlings from seed of known weight germinated in pure water and in darkness, when grown in an atmosphere free of CO_2 but with the roots in water containing CO_2 only, increased in dry weight above that of the original seed. This increase is due to the absorption of C by means of the roots, this C being utilized just as the CO_2 absorbed from the air. *Zea Mays, Acer pseudo-platanus, Quercus, Aesculus* and other plants were used in these experiments.—*P. D. Caldis*

7942. Pollacci, Gino, e Bernardo Oddo. **Influenza de nucleo pirrolico nella formazione della a clorofilla. Nota IIa.** [Influence of the pyrrole ring on the formation of chlorophyll.] Atti Ist. Bot. Univ. Pavia Ser. II, 17: 131–145. *Fig. 1–4.* 1920.—The authors discuss the biochemical importance of the pyrrole ring in chlorophyll and report cultural experiments conducted on *Zea Mays, Solanum nigrum, Datura stramonium, Euphorbia* sp. and *Aster sinensis*, with a view of finding the influence exercised by a pyrrole compound, such as Mg pyrrole carbonate, on the coloring of protoplasts when added to a culture solution free of Fe The plants were grown in a culture solution containing 1 gm. $Ca(NO_3)_2$, 0.25 gm. $(NH_4)_2SO_4$, 1 gm. KNO_3, 0.25 gm. K_2HPO_4 per l. H_2O, using chemicals and H_2O free of Fe. To 1 set of cultures 0.2336 gm. Mg pyrrole carbonate per l. of solution was added. The results show that plants grown in a solution containing a pyrrole compound form chlorophyll even in the absence of Fe. The authors think that the Fe serves as a catalyzer in the formation of the pyrrole ring which is the center of the chlorophyll complex, and when the ring is already supplied, Fe is not necessary. They conclude that pyrrole and Mg are the elements that are responsible for chlorophyll development.—*P. D. Caldis.*

METABOLISM (GENERAL)

7943. Anderson, R. J. **The phytosterols of the endosperm of corn.** Jour. Amer. Chem. Soc. 46: 1450–1460. 1924.—The two phytosterols found were sitosterol and dihydrosterol. —*J. M. Brannon.*

7944. Anderson, R. J., and Fred P. Nabenhauer. **The phytosterols of wheat endosperm.** Jour. Amer. Chem. Soc. 46: 1717–1721. 1924.—The wheat endosperm contains at least 2 different sterols, namely, ordinary sitosterol and dihydrosterol.—*J. M. Brannon.*

7945. Berthelot, Albert, et G. Amoureux. **Sur le présence d'acide pyruvique dans le contenu intestinal.** [Pyruvic acid in the intestinal contents.] Bull. Soc. Chim Biol. 6: 338–339. 1924.—Pyruvic acid was isolated as the phenylhydrazone from the feces of an individual having an intestinal flora rich in *B. aminophilus.* Similar results were obtained on examination of the contents of the small intestine of a guinea pig fed 4 days previously with a fresh culture of *B. aminophilus.* Results with the contents of the large intestine were negative.—*Joseph S. Caldwell.*

7946. Berthelot, Albert, et G. Loiseau. **Influence du pyruvate de sodium sur la formation de la toxine tetanique.** [Influence of sodium pyruvate on the formation of tetanus toxin.] Bull. Soc. Chim. Biol. 6: 340. 1924.—Addition of glucose and neutral Na pyruvate to the culture medium in which *B. tetani* was grown increased the toxicity of the culture for guinea pigs more than 3-fold.—*Joseph S. Caldwell.*

7947. Berthelot, Albert, et A. R. Prevot. **Influence du pyruvate de sodium sur la production de toxine par le B. oedematiens.** [Influence of sodium pyruvate on toxin production by B. oedematiens.] Bull. Soc. Chim. Biol. 6: 342. 1924.—*B. oedematiens* is one of the most difficult to cultivate among the organisms producing gaseous gangrene. It can be readily grown in flasks plugged only with cotton if Na pyruvate is added to the culture medium, and the production of toxin in such cultures equals or exceeds that in the usual anaerobic cultures. No growth occurs in open culture in the absence of pyruvate.—*Joseph S. Caldwell.*

7948. Deniges, Georges. **Théorie et conséquences de l'action antagoniste de l'ion trichlor-acétique sur les proprietes reductrices des sucres.** [Theory and results of the antagonistic action of trichloracetic ion upon the reducing power of sugars.] Bull. Soc. Chim. Biol. 6: 397–400. 1924.—Various authors have found that determinations of sugar in blood with

Fehling's solution after precipitation of albumins with trichloracetic acid are not trustworthy but no explanation has been offered. In the presence of trichloracetic acid, sugar reduces a cupric salt to cuprous and this in the presence of water, reduces a corresponding quantity of trichloracetic ion and returns to the original form without any alteration in color of the reagent. $4\ CuOH + 4\ H_2O + CCl_3 = 4\ Cu(OH)_2 + CH_2Cl + 2\ ClH$. Cu, in an alkaline medium, behaves as a catalyzer of reduction. The reaction is specific, mono- and di-chloracetic acids being unattacked. Alkaline mercuri-potassic iodid and sodium-ammonium silver nitrate are not affected and may be used in determining sugar in the presence of trichloracetic ion.—*Joseph S. Caldwell.*

7949. Gortner, Ross Aiken, and Walter F. Hoffman. **Quantitative estimation of chlorides and sulphates in expressed plant tissue fluids.** Bot. Gaz. 77: 96-110. 1924.—An adaptation of Wetmore's method of determining the chlorides in blood was made to plant sap. The method involves the precipitation of the protein and the determination of the chloride in the filtrate. In the case of SO_4, the Benedict-Denis method for determining S in urine was adapted to plant sap investigations. For both of the above methods, it is stated that they may be used satisfactorily in field stations; that they possess a high degree of accuracy, use a minimum of material, are rapid and do not require complicated apparatus or exceptional skill.—*B. W. Wells.*

7950. Lawrence, John V., and J. Arthur Harris. **Tests of a wet oxidation and modified Volhard method for the determination of chlorides in plants.** Jour. Amer. Chem. Soc. **46**: 1471–1477. 1924.

7951. Mameli, Eva. **Riserche fisiologiche sui Licheni. I. Idrati di carbonio.** [Physiological researches on lichens. Carbohydrates.] Atti Ist. Bot. Univ. Pavia Ser. II, 17: 147–157. 1920.—Microchemical tests show glycogen in the thallus of many homoimerous lichens, starch in the thallus of many heteroimerous lichens, insoluble amyloids in the hymenium of about 100 species both homoimerous and heteroimerous, besides the lichenin and isolichenin the presence of which has been known for a long time.—*P. D. Caldis.*

7952. Montemartini, Luigi. **Sopra la circolazione delle sostanze minerali nelle foglie.** [Circulation of mineral substances in leaves.] Atti Ist. Bot. Univ. Pavia Ser. II, 17: 227–256. 1920.—Quantitative analysis of the ash obtained from leaves of different species of plants, collected in the evening and in the morning, shows that certain quantities of mineral substances pass during the night from the green leaves exposed to light into the trunk. This translocation takes place in a smaller proportion than in the case of the organic substances and the leaves contain in the morning a larger percentage of ash than in the preceding evening. In some cases the opposite is true. Among the substances that take part in this translocation are 1st Ca and then K and P. The translocation of Ca and of the other substances is more evident the more active the photosynthesis had been. Ca is translocated during the 1st hours of the evening, when the translocation of the sugars is more active. The other elements move more uniformly during the night. The author concludes that Ca combines with the products of photosynthesis forming soluble diffusible compounds which pass from one cell to the other, and the rate of diffusion is directly proportional to the density of the solution in which they are found and is greater during the 1st hours of the night when such compounds are more abundant. The K and the P however, form compounds of a different nature which move more uniformly in the sieve tubes. Different species of the genera *Calycanthus, Aesculus, Phaseolus, Mahonia, Ailanthus, Robinia, Helianthus, Fagus, Corylus, Eucalyptus, Nerium, Juglans* and *Ficus* were used in these investigations.—*P. D. Caldis.*

7953. Morgan, E. J., C. P. Stewart, and F. G. Hopkins. **On the anaerobic and aerobic oxidation of xanthin and hypoxanthin by tissues and by milk.** Proc. Roy. Soc. London B, **94**: 109–131. *Fig. 1–3.* 1922.—Milk and certain animal tissues bring about the oxidation of xanthin and hypoxanthin to uric acid, either aerobically or anaerobically, in the presence of methylene blue as a H acceptor. The relative O_2 uptake of the 2 substances corresponds with theoretical requirements, twice as much being used by hypoxanthin as by xanthin. The process, however, goes on at equal molecular rates. The evidence seems to indicate that a single catalyst is responsible throughout, but it is not clear whether oxidation is accomplished by an oxidase system in the ordinary sense, by a hydrolytic oxidation-reduction proc-

ess, or by the activation and transport of H. More than likely the preliminary addition of H_2O is involved.—*P. B. Sears.*

7954. Pollacci, Gino. **Studi sui proteosomi e sulla reazione vitale di Loew e Bokorny.** [Studies on the proteosomes and the vital reaction of Loew and Bokorny.] Atti Ist. Bot. Univ. Pavia Ser. II, 17: 103–117. *Pl. 3.* 1920.—The author repeats the experiments of Loew and Bokorny on the reduction of alkaline solutions of $AgNO_3$ in contact with living protoplasm, due to the presence of aldehydes, and the formation of granulations (proteosomes) in cells treated with alkalies and alkaloids. Use was made of a variety of plants belonging to the families Amaryllidaceae, Commelinaceae, Cyperaceae, Orchidaceae, Ranunculaceae, Begoniaceae, Tiliaceae, Balsaminaceae, Geraniaceae, Rosaceae, Ericaceae, Primulaceae, Oleaceae, Convolvulaceae, Verbenaceae, Scrofulariaceae, Acanthaceae, Campanulaceae, and Compositae. Roots, leaves, bracts, stamens, pistils, and petals were used. The author concludes that all these plants give a positive reaction with the Loew and Bokorny reagent. However, not all the plasmas killed with alcohol, ether or boiling water are inactive to the reagent, indicating that not all protoplasm that gives the reaction is living. He also finds that all cells treated with alkalies, alkaloids or substances possessing the properties of alkaloids form proteosomes which disappear when the cells are immersed in distilled water and appear again when they are replaced in alkaloidal solutions. The proteosomes reduce the Loew and Bokorny reagent and the reaction occurs whenever proteosomes are formed. Once formed, the proteosomes remain active, reduce the Ag salt, and do not change morphologically even if the tissues are killed with alcohol. Probably the reaction is due to aldehyde groups localized in the proteosomes.—*P. D. Caldis.*

7955. Spoehr, H. A. **The oxidation of carbohydrates in the air.** Jour. Amer. Chem. Soc. 46: 1494-1503. 1924.—Hexoses are oxidized by air in the presence of solutions containing Na_2HPO_4 and methylene blue, with formation of CO_2. Fe accelerates this reaction. Sucrose, trehalose, mannitol and glycerol may also be oxidized in the same way. Some evidence was found to show that glucose in a solution containing Na_2HPO_4 undergoes transformation into levulose. Sodium ferro-pyrophosphate is a more active catalyst than methylene blue under these conditions.—*J. M. Brannon.*

7956. Thomas, Walter. **The colorimetric determination of carbohydrates in plants by the picric acid reduction method. 2. The determination of starches and other "reserve carbohydrates."** Jour. Amer. Chem. Soc. 46: 1670–1675. 1924.

7957. Thomas, Walter, and R. Adams Dutcher. **The colormetric determination of carbohydrates in plants by the picric acid reduction method. 1. The estimation of reducing sugars and sucrose.** Jour. Amer. Chem. Soc. 46: 1662–1670. 1924.

METABOLISM (ENZYMES, FERMENTATION)

7958. Abbott, Ernest V. **The occurrence and action of fungi in soils.** Soil Sci. 16: 207–216. 1923.—From 5 soils 28 species of fungi, representing 12 genera were isolated. With 2 exceptions the organisms tested were vigorous ammonifiers. All of the species tested ammonified cottonseed meal more readily than dried blood, with the single exception of *Acrostalagmus albus. Aspergillus fumigatus, A. flavus, Penicillium funiculosum, P. luteum,* and *Cladosporium herbarum* liberated soluble P from raw rock phosphate. *P. luteum* was the only one tested which oxidized free S to SO_4. In composts of S and raw rock phosphate only *Aspergillus Koningi, Penicillium funiculosum* and *Mucor glomerula* liberated soluble P.—*W. J. Robbins.*

7959. Armstrong, Henry E. **Studies on enzyme action XXIII. Homo- and heterolytic enzymes.** Proc. Roy. Soc. London B, 94: 132–133. 1922.—Referring to the work of Morgan, Stewart & Hopkins on the oxidation of xanthin and hypoxanthin to uric acid in animal tissues and milk, attention is called to the fact that both bases are "hydroxylated" at equal molecular rates, although one requires twice as much O_2 as the other. The enzyme involved is stated to differ from ordinary hydrolytic enzymes in that "instead of inducing the distribution of the elements of the hydrone molecule between 2 sections of a single molecule of the hydrolyte, it is the cause of the inclusion of 2 distinct molecules in the circuit of change." It is suggested that "the 2 classes of enzymes be distinguished as homo- and heterolytic."—*P. B. Sears.*

7960. Арциховский, B. M. [Artsikhovski, V. M.] **Об антолизах у Hyoscyamus niger L.** [Antholysis of Hyoscyamus niger L.] Журнал Русскаго Ботаническаго Общества [Jour. Russian Bot. Soc.] 4: 1–10. *4 fig.* 1919 [1920].

7961. Berthelot, Albert, et Robert Poinsot. **Sur la presence d'acide pyruvique dans les cultures de certains Mucor.** [Pyruvic acid in cultures of certain strains of Mucor.] Bull. Soc. Chim. Biol. 6: 343–344. 1924.—It is known from the work of Goy that the growth of *Mucor* in culture media results in better growth of *B. diphtheriae*, *B. tuberculosis*, various streptococci, and anaerobes such as *B. histolyticus*, *B. sporogenes*, and *B. perfringens*. Three strains of Mucor were grown in a synthetic medium containing sucrose. Analysis of the medium showed the presence of pyruvic acid at the end of 15 days; at the end of 3 weeks it was no longer found. Its formation by the fungus is believed to explain the favorable effect upon subsequent growth of bacteria in the medium.—*Joseph S. Caldwell.*

7962. Eto, Itsuo. **Beiträge zur Kenntnis des Gliadins.** [The chemistry of gliadin.] Jour. Biochem. Tokyo 3: 373–392. 1924.—Gliadin, prepared from wheat gluten by the method of Osborne and Harries and having 17.2% N and 0.17% ash on the water free basis, was employed. The solubility of this preparation in 60–70% alcohol at 30° was unlimited, in 80% or 50% alcohol its solubility was slightly more than 1%. At 10–11°C. it dissolved to the extent of 0.92% in N/40 NaOH and to 0.7% in N/320 HCl, the solubility in both cases falling off at higher and lower concentrations. The isoelectric point is pH 6.6. The proteoclastic enzyme of wheat malt was isolated and compared with a commercial pepsin as to its action upon gliadin. The action of the 2 enzymes is identical, no free NH_3 being formed in either case. Partial hydrolysis at 70°C. for 48 hours in 64% alcohol containing 0.8% HCl produced splitting off of 95% of the separable NH_3, 25% of the non-amino N, 10% of the diamino N and 4% of the monoamino N. The solubility of the residue of hydrolysis in 70% alcohol or in N/320 HCl was greatly reduced, while solubility in N/40 NaOH was greatly increased. The hydrolysis product contains no precipitin.—*Joseph S. Caldwell.*

7963. Kayser, E. **Production d'acide pyruvique et d'alcool ethylique aux depens du lactate de calcium par les levures.** [Production of pyruvic acid and ethyl alcohol at the expense of calcium lactate by yeasts.] Bull. Soc. Chim. Biol. 6: 345–351. 1924.—Yeasts grown in a culture medium containing Ca lactate produce pyruvic acid, the amounts formed varying considerably with the race employed, the concentration of the lactate, the temperature, the surface exposed to the air, and the light. Mixed cultures of 2 or 3 strains, as of wine, beer, and dairy yeasts, produce more acid than single cultures. Ethyl alcohol is formed simultaneously, and was identified by the methods of Nicloux and Duclaux.—*Joseph S. Caldwell.*

7964. Rockwood, Elbert W. **The mechanism of the amino promoters upon enzymes.** Jour. Amer. Chem. Soc. 46: 1641–1645. 1924.—The promoters studied were glycine, aspartic acid and 1 substituted amino acid, hippuric acid. The rapidity of decay of the enzyme was found by comparing the amount of NH_3 formed in 1-hour fermentation periods, after the enzyme solution had stood for different intervals. The deterioration was more rapid in the 1st few hours. It was found that the effect of the promoters was due to 2 distinct factors: a prevention of the decay of the enzyme and a specific stimulating effect.—*J. M. Brannon.*

7965. Sherman, H. C., A. W. Thomas, and M. L. Caldwell. **The iso-electric point of malt amylase.** Jour. Amer. Chem. Soc. 46: 1711–1717. 1924.—The iso-electric point for malt amylase is at pH 4.3–4.5 which coincides with that of its optimum enzyme action upon starch. This enzyme exerts its optimum effect upon starch when it is least ionized and least hydrated. This may be accounted for by the possibility of its attraction for the starch particles being the greatest when its combination with water is the least."—*J. M. Brannon.*

METABOLISM (RESPIRATION, AERATION)

7966. Burge, W. E., and E. L. Burge. **Effect of temperature and light on catalase content of Spirogyra.** Bot. Gaz. 77: 220–224. *2 fig.* 1924.—Using material taken from a frozen pond in midwinter and determining the catalase by H_2O_2, after grinding, it was found that a fall in temperature produces a decrease and a rise in temperature an increase in the catalase of *Spirogyra*. Light also produces an increase in this catalase, less extensive, however, than that brought about by a rise in temperature; this is in keeping with the fact that

light is less effective than rise in temperature in accelerating the metabolism of plants. Whatever increases or decreases the respiratory metabolism in animals produces a corresponding increase or decrease in catalase. From this and other work on the subject, it would seem probable that the same relationship exists between catalase and the respiratory metabolism in plants. Hence the suggestion is made that in both plants and animals catalase may be the enzyme which is principally responsible for the respiratory metabolism.—*B. W. Wells.*

7967. Fernandes, D. S. **Aerobe und anaerobe Atmung bei Keimlingen von Pisum sativum.** [Aerobic and anaerobic respiration in seedlings of P. sativum.] Recueil Trav. Bot. Neerland. **20:** 107–256. *22 fig.* 1923.—The writer has constructed an apparatus (p. 112–138) for the simultaneous determination of intake of O_2 and evolution of CO_2.—(1) Normal respiration: During germination at 20–25°C., respiration showed an increase up to a maximum, after which it decreased. The evolution of CO_2 and intake of O_2 have a tendency to increase during germination. At 25° the maximum of the large period was reached in 3 days; at 20° in 4 days. Respiration intensity at 25° was greater than at 20° for the first 5 days. During H_2O absorption the evolution of CO_2 was greater than the intake of O_2. The quotient, CO_2/O_2, is, therefore, at the beginning of germination greater than 1. Later, the value of this quotient decreased. After H_2O absorption was completed O_2 intake and CO_2 production at 20 and 25° paralleled one another. At higher temperatures (45°) O_2 intake and CO_2 production were equally influenced by temperature, but at 50 and 55° deviations occurred.—(2) Anaerobic respiration: After 4 days in a H stream at 25° the swollen seed developed normally. In H continuously no complete germination occurred. During anaerobic respiration *Pisum sativum* develops about $\frac{1}{10}$ of the energy released during normal respiration. The duration of the pre-period when the seedlings are in the air influences the process of anaerobic respiration.—*J. C. Th. Uphof.*

7968. Terroine, Emile F., R. Bonnet, et P. H. Joessel. **L'energie de croissance. II. La germination.** [The energy of growth. II. Germination.] Bull. Soc. Chim. Biol. **6:** 357–393. 1924.—Continuing the study begun by Terroine and Wurmser (Bot. Absts. 13, Entry 3088) the authors endeavor to determine the energy yield in the process of germination for 3 classes of seed—(1) those rich in stored carbohydrate, represented by rice and sorghum; (2) in fats, peanut and flax being used; (3) in proteins, as pea and lentil—to ascertain if the energy values obtained are functions of chemical composition, and to find the proportion of the total energy output expended in the manufacture of carbohydrate and cellulose from each of the 3 classes of foods. Comparative studies to determine the extent of variation in individuals of the same species or in different species of like composition, and to ascertain the effect of varying temperatures, were also made. The method employed consisted in calorimetric determinations of the energy values of dry seed, growth of plants for a short period, and like determinations upon seedlings and upon the unconsumed residues of the seed. In the case of peanuts, a single cotyledon was removed and used for a check, the seedling making its growth upon the food of the remaining cotyledon, after which determinations were made upon cotyledon and seedling, the possible effects of the wound made being disregarded. Distilled water cultures were grown in darkness in glass tubes 25 by 3 cm., having a constriction 6 cm. from 1 end for supporting the seed. With peanuts, the period of growth ranged from 3 to 30 days, but the ratio of material used to gain in weight was constant for a number of individuals regardless of time. For the starchy seed, rice and sorghum, the utilization of material for growth is highest, the energy yield equalling 73%. In protein-rich seed, pea and lentil, it is about 63%; in fat-rich seed, flax and peanut, it is 53%. Consequently, the yield is independent of species and depends upon chemical composition; it is also independent of temperature, being constant within the range compatible with life. In the light of these results the authors feel justified in rewording Rubner's law of specific dynamic action of food stuffs so as to make it an universal biochemical law. That is, all new formation of carbohydrates involves little or no variation in energy if it occurs at the expense of other carbohydrates, a sensible but small loss if fats are the materials used, and a very considerable loss if proteins are employed.—*Joseph S. Caldwell.*

ORGANISM AS A WHOLE

7969. Berthelot, Albert. **Recherches biochimiques sur l'acide pyruvique.** [Biochemical studies on pyruvic acid.] Bull. Soc. Chim. Biol. 6: 326–335. 1924.—Following up an observation that the growth of such aerobic intestinal bacteria as *B. aminophilus* and *B. lactis aerogenes* in glucose media favored the development therein of such anaerobes as *B. perfringens*, *B. sporogenes* and *B. histolyticus*, the author found that this result was due to the formation of pyruvic acid by the aerobes. By addition of glucose and pyruvic acid as Na or K pyruvate to Martin's bouillon, it is possible to secure good growth of *B. tetani*, *B. botulinus*, *B. fallax*, *B. perfringens*, *B. sporogenes*, *B. putrificus*, *B. histolyticus*, *B. oedematiens*, *B. aerofoetidus*, *B. bifermentans*, *B. anthrax*, and other anaerobes in open tubes plugged with cotton. A latent period elapses before vigorous growth begins, probably occupied by the conversion of pyruvic acid into acetylmethylcarbinol. Anaerobes grown in open culture in the presence of pyruvic acid are much more sensitive to the reaction of the medium than are the same forms grown in sealed tubes under an atmosphere of H, hence it is necessary to carefully adjust the pH value of the medium.—*Joseph S. Caldwell.*

7970. Berthelot, Albert, et G. Amoureux. **Influence du pyruvate de sodium sur les bactéries phosphorescentes.** [Influence of sodium pyruvate on phosphorescent bacteria.] Bull. Soc. Chim. Biol. 6: 336–337. 1924.—Cultures of an unnamed phosphorescent bacterium isolated from fish and grown in a synthetic medium are more strongly phosphorescent for a longer period when 4 gm. Na pyruvate per l. are added to the medium. When 8 gm. each of Na pyruvate and urea are added per l., phosphorescence is further increased and persists twice as long as in their absence. The medium must be exactly neutral.—*Joseph S. Caldwell.*

7971. Berthelot, Albert, et Pierre Seguin. **Sur la culture des spirochètes dans des milieux additionnes de pyruvate de sodium.** [Culture of spirochaetes in media containing sodium pyruvate.] Bull. Soc. Chim. Biol. 6: 341. 1924.—*Spirochaeta dentium* and *S. tenuis* made no growth in bouillon-serum, but when Na or K pyruvate was added the growth was only slightly less vigorous than in Noguchi's medium, and the culture remained living more than 1 month at 37°.—*Joseph S. Caldwell.*

7972. Fleming, A., and V. D. Allison. **Further observations on a bacteriolytic element found in tissues and secretions.** Proc. Roy. Soc. London B, 94: 142–151. 1922.—Continuing earlier work in which an organism, *Micrococcus lysodeiktus*, was shown to be especially valuable as an indicator of the lytic action of certain tissues and secretions, it is found that certain strains of the organism can be developed which resist such lysozome action. Where such strains appear they resist the lytic action of all tissues showing it, whether from man, lower animals, or plants (e.g., turnip). It was also noted that where solution of an organism takes place, such action results in an increased solvent power of the fluid for that particular organism.—*P. B. Sears.*

7973. Lutz, G. **Beiträge zur Variabilität des Milzbrandbacillus.** [Variability in Bacillus anthracis.] Zeitschr. Hygiene u. Infecktionskrankh. 97: 12–25. *6 pl., 5 fig.* 1923.—From observations of living and stained cultures a correlation of morphological with physiological variations in *B. anthracis* is described.—*W. H. Chambers.*

7974. Mameli, Eva, ed Eugenia Aschieri. **Riserche anatomiche e biochemiche sul Lychnis Viscaria Linn.** [Anatomo-biochemical researches on L. Viscaria.] Atti Ist. Bot. Univ. Pavia Ser. II, 17: 119–129. *Pl. 4.* 1920.—*L. Viscaria* captures insects by means of a viscous secretion from a great number of glands distributed on a portion of the stem situated underneath every node and composed of 2 cells: a small, almost spherical lower 1, and a conical, swollen upper cell. These glands are distributed irregularly, isolated or in groups of 6, chiefly in the ring under the inflorescence and are absent from the non-viscous part of the stem. The non-viscous parts have more stomata and the epidermis is covered with a layer of wax. The viscous substance contains a mucilage, probably pectic, accompanied by an oily and an acid substance, similar chemically to the secretions of *Cypripedium* and *Primula*. The viscous internodal zone of *L. viscaria* contains a proteolytic enzyme which renders proteins slowly soluble and is permeable to H_2O but very slowly to proteins. The authors think that on account of the limited extent of the absorbing surface the albuminoid substances

of the insects are absorbed very little. Plants catching no insects do not differ in growth from those that catch many or few. Absence or scarcity of light inhibits the formation of the viscous substance.—*P. D. Caldis.*

7975. Martin, Wm. H. **Influence of soil moisture and acidity on the development of potato scab.** Soil Sci. **16**: 69–73. 1923.—Observations in the field indicate H-ion concentration and not moisture content of the soil to be the factor in reducing potato scab. A greenhouse experiment in soil with water at 30, 40, 50 and 60% of the moisture holding capacity and at the 2 reactions, pH 5.1 and pH 6.9, showed a less amount of scab in all cases in the more acid soils. The amount of scab was less in the wetter soils, this decrease being more marked in the acid series.—*W. J. Robbins.*

7976. Muller, Karl Otto. **Untersuchungen zur Entwicklungsphysiologie des Pilzmycels.** [Physiology of the development of fungous mycelium.] Beiträge Allg. Bot. **2**: 276–322. *Fig. 1–8.* 1922.—The problems of the production of circular colonies of fungi on agar plates and of flattened spheres in liquid media are considered in this paper. Careful studies were made of the development of *Saprolegnia monoica, S. Thureti, Mucor mucedo, M. stolonifer, Aspergillus niger, Penicillium glaucum,* and *Sclerotinia Sclerotiorum.* The development of the mycelium from single spores of the above species is followed in detail, with a consideration of methods of branching. The radial branching of the colonies Muller holds to be the result of negative chemotropism of the hyphae to their own metabolic products. The rate of spread of the colonies as influenced by kind and concentration of nutrients substances, is studied as well as the influence of temperature.—*Orton L. Clark.*

7977. Mutto, Elisa, e Gino Pollacci. **Ulteriori ricerche intorno alla variazione di alcune specie di micromicheti. Seconda Nota.** [Further researches on the variations of some species of micromycetes.] Atti Ist. Bot. Univ. Pavia Ser. II, **17**: 53–57. *Pl. 2.* 1920.—The authors studied in culture *Phyllosticta pirina* Sacc. and *Coniotherium pirinum* (Sacc.) Sheldon the latter, according to the writers, being a synonym for *C. tirolense* Bubák. They conclude that different media influence the intensity of color and the dimensions of the spores of *C. tirolense. P. pirina* on beer-must gelatine and lemon gelatine neutralized with NaOH, assumes the characteristics of the genus *Ascochyta,* namely, septate spores and weak color; these characteristics remain constant in subsequent generations on the same medium but are lost on other media. The authors designate as "macrosporioidi" special structures in *P. pirina* called by Crabill "appressoria."—*P. D. Caldis.*

7978. Pringsheim, Ernst G. **Zur Physiologie saprophytischer Flagellaten.** [Physiology of saprophytic flagellates.] Beiträge Allg. Bot. **2**: 88–137. 1921.—Various saprophytic flagellates, the species varying with materials and temperature, develop in the dark on a medium composed of protein material covered with soil or mud and under water. The forms usually found were *Polytoma uvella* and in especially large numbers *Astasia ocellata* and *Chilomonas paramaecium.* As a result of bacterial action NH_3 salts of fatty acids are formed which serve as nutrients for *Polytoma* especially, and other organisms. *Polytoma* is a pronounced acetate organism, and is strongly aerotaxic as well as positively chemotaxic to salts of fatty acids and NH_3 salts. *Astasia* thrives at high temperatures and in an acid medium, does not require fatty acids but cannot grow without NH_3 salts and amino acids. *Chilomonas* thrives in neutral glycocollacetate solutions, cannot use NH_3 N, and will not grow on agar.—*Orton L. Clark.*

GROWTH, DEVELOPMENT, REPRODUCTION

7979. Bose, J. C. **The balanced crescograph.** Trans. Bose Res. Inst. Calcutta **2**: 255–267. *Fig. 96–97.* 1919.—A new form of automatic recorder is described by which it is possible to observe accurately variations in rate of growth elongation as small as 10^{-9} inch per second. The actual growth elongation is not recorded but is exactly compensated by an equal subsidence of the plant-holder. The pointer attached to the regulator of the compensating device indicates on the calibrated scale the exact rate of subsidence per second, which, under balanced conditions, is also the actual rate of growth. The normal rate exactly balanced gives a horizontal record. Variation induced in the growth rate upsets the balance and is immediately detected by the flexure—upward movement indicating acceleration,

downward movement retardation. The latent period and the after-effect of any stimulus could be determined with the highest accuracy. CO_2 induces preliminary acceleration in less than 5 seconds, followed by depression. Dilute ether vapor induces acceleration which persists for a considerable length of time. Chloroform vapor induces preliminary acceleration followed by depression; prolonged application induces death.—*B. Sen.*

7980. Bose, J. C., and Guruprasanna Das. **Response of plants to wireless stimulation.** Trans. Bose Res. Inst. Calcutta 2: 416–424. *Fig. 153–156.* 1919.—Plants not only perceive but also respond to long ether waves employed in signaling through space. The Mimosa pulvinus exhibits both electric and mechanical response to wireless stimulation. Growing plants exhibit acceleration of growth when acted on by a feeble stimulus and retardation under a strong stimulus.—*B. Sen.*

7981. Hendricks, Esten, and R. B. Harvey. **Growth of plants in artificial light required for blooming.** Bot. Gaz. 77: 330–334. *1 fig.* 1924.—Using Mazda lamps and varying the light intensity by placing the plants at different distances from the light source, it was found that under continuous illumination plants bloomed over a wide range. The species were distributed with regard to the range of intensities under which blooming occurred, from the wide range of a form like *Amaranthus retroflexus* (500–10,632 foot-candles) to the restricted range of *Tropaeolum minus* (250–450 foot-candles). The speeding up of the time of blooming of Easter lilies (one month gain over greenhouse checks) was found to be correlated with the increase in carbohydrate content under continuous illumination. Under the latter condition, Mirabilis flowers did not open unless the lights were turned off for an hour, or a violent fluctuation in moisture or temperature was introduced.—*B. W. Wells.*

MOVEMENTS OF GROWTH AND TURGOR CHANGES

7982. Beekman, W. L. **Über die Torsion des Stengels von Psilotum Bernhardi. Beiträge zur Kenntnis der autonomen Bewegungen.** [Torsion of the stem of Psilotum Bernhardi a contribution toward a knowledge of autonomous movements.] Recueil Trav. Bot. Néerland. 21: 1–108. *53 fig.* 1924.—The writer distinguishes 5 different kinds of torsions. That of *Psilotum Bernhardi* is an autonomous nutation as far as demonstrated by plasmolytic experiments, but at the same time the plant was shown to possess also another nutation for as the stem dried out it developed a strong torsion to the right. This hygroscopic torsion is found in all stems during drying. The causes of these 2 movements are described as related to the various tissues of the plant. The direction of the normal torsion is influenced by the elements of the protoxylem; that of the hygroscopic torsion, by the peripheral sclerenchyma. The protoxylem as well as the outer layers of the sclerenchyma are subject to a drawing out. —*J. C. Th. Uphof.*

7983. Bose, J. C. **Diurnal movements in plants.** Trans. Bose Res. Inst. Calcutta 2: 523–534. *Fig. 188–189.* 1919.—The various factors involved in nyctitropic movements are enumerated and their relative effects discussed. The most important factors in the diurnal movements of plants are shown to be the effects of variations of light and of temperature on growth and on geotropic curvatures. From continuous records of diurnal curves the effects of these factors could be discriminated. In the morning and in the evening the pronounced flexures in the curves are due to the effects of light and of darkness. The effects due to light and to temperature can be distinguished from the fact that the period of maximum light intensity, or "light-noon" is about 2 hours earlier than the "thermal-noon" when temperature is at a maximum.—A flexure in the diurnal curve about thermal-noon, when an inversion occurs from rise to fall of temperature, indicates the effect of temperature. Two different classes of phenomena due to variation of temperature are distinguished: thermonasty and thermo-geotropism.—*B. Sen.*

7984. Bose, J. C. **Geotropism.** Trans. Bose Res. Inst. Calcutta 2: 425–441. *Fig. 157–163.* 1919.—A new geotropic recorder is described. Both electric and mechanical responses show that the stimulus of gravity induces reactions similar to those induced by other stimuli and that the upper side of a horizontally laid shoot is more effectively stimulated than the lower. The geotropic response of the stem is considered positive as it is the directly stimulated side which undergoes contraction. The reduction of weight shortens the latent period;

in the case of the petiole of *Tropaeolum* this is less than 20 seconds. The latent period of geotropic response is shown to be of the same order as the "migration period" of the statoliths. The complete geotropic curve shows characteristics similar to tropic curves in general. The differential excitabilities of dorsiventral organs modify the position of geotropic equilibrium.—*B. Sen.*

7985. Bose, J. C. **On phototropism.** Trans. Bose Res. Inst. Calcutta *2*: 313–327. *Fig. 112–117.* 1919.—The various factors involved in phototropic reactions are enumerated and it is shown that positive phototropic curvature is brought about by the joint effects of contraction of the directly stimulated proximal side and expansion of the indirectly stimulated distal side in both pulvinated and growing organs. The after-effect of light of moderate intensity is shown to be an acceleration of growth, which hastens recovery of phototropic curvature. In tissues in which the power of transverse conduction is negligible, the positive phototropic curvature under continued action of light attains a maximum without neutralisation or reversal. The latent period of photic reaction is shortened with increasing intensity of light. Under strong light the reaction takes place within a few seconds. Seedlings of wheat are shown to respond to a flash of light from an electric spark, the duration of which is about $\frac{1}{1000}$ second.—*B. Sen.*

7986. Bose, J. C. **On thermo-geotropism.** Trans. Bose Res. Inst. Calcutta *2*: 509–519. *Fig. 184–187.* 1919.—The position of equilibrium under geotropic action is not fixed but undergoes marked changes with variation of temperature; lowering of temperature increases all forms of geotropic curvature and torsion, while rise decreases them.—*B. Sen.*

7987. Bose, J. C. **On tropic movements.** Trans. Bose Res. Inst. Calcutta *2*: 268–270. 1919.—This is a general discussion on factors which determine tropic movements.—*B. Sen.*

7988. Bose, J. C. **The diurnal movement of the leaf of Mimosa.** Trans. Bose Res. Inst. Calcutta *2*: 576–597. *Fig. 210–220.* 1919.—It is shown that the Mimosa leaf has an autonomous movement of its own, the period of a single pulse being about 6 hours. Its diurnal curve is similar to the standard thermo-geotropic curve, showing erectile movement from thermal-noon to thermal-dawn and a fall from thermal-dawn to thermal-noon, except that a spasmodic fall brought on by over-shooting, is observed toward evening. This is due to stoppage of post-maximum light, and not to increased mechanical movement caused by forward position of sub-petioles, as leaves with sub-petioles removed exhibit a similar fall. Diurnal torsional movement is similar to the normal curve. Diurnal movement in the leaf of *Cassia alata* is similar to that in *Mimosa*.—*B. Sen.*

7989. Bose, J. C. **The mechanical and electrical response of root to various stimuli.** Trans. Bose Res. Inst. Calcutta *2*: 461–466. *Fig. 170–171.* 1919.—A direct unilateral stimulus applied at the region of growth induces a positive curvature by the contraction of the proximal and expansion of the distal sides, their electric concomitants being galvanometric negativity and positivity, respectively. Stimulus applied at the root tip produces in the growing region an expansion and galvanometric positivity. The assumption of the specific irritability of the root as different from that of the shoot is shown to be without justification.—*B. Sen.*

7990. Bose, J. C. **The phototropic curve and its characteristics.** Trans. Bose Res. Inst. Calcutta *2*: 346–361. *Fig. 130–134.* 1919.—From the continuous dotted records of phototropic curves taken on a uniformly moving plate under continued stimulation, the susceptibility of excitation (excitation/stimulus) for each point of the curve is determined. The simple phototropic curve of vigorous Erythrina pulvini under continued strong light shows a remarkable similarity to the magnetisation curve of iron, that is, the susceptibility for excitation is feeble at the beginning, increases very rapidly with increasing stimulus, and attains a maximum beyond which increase of stimulus produces no further effect. However, when the intensity of light is sub-minimal its continued application, in both pulvinated and growing organs, induces 1st a negative curvature and then the normal positive one which after attaining a maximum, is neutralized and reversed into negative. The complete phototropic curve thus crosses the abscissa twice, showing that Weber's law is not applicable for the entire range of stimulation; the quantitative relation fails in the region of sub-minimal stimulus where the physiological reaction is qualitatively different.—*B. Sen.*

7991. Bose, J. C., and Guruprasanna Das. **Dia-phototropism and negative phototropism.** Trans. Bose Res. Inst. Calcutta 2: 328–337. *Fig. 118–121.* 1919.—The mechanics of dia- and negative phototropism are explained. These are observed only in tissues possessing transverse conductivity, and when excitation is transmitted to the distal side. Such phototropisms are determined by intensity and duration of stimulus, thickness and conductivity of the intervening tissue, and relative excitability of the 2 sides. Direct sunlight is found to be very effective but, due to transmission of excitation, positive curvatures are neutralised. It is shown that positive dia- and negative phototropic curvatures are due not to 3 distinct irritabilities but are brought about by the excitatory reaction remaining localised or being increasingly transmitted to the distal side.—*B. Sen.*

7992. Bose, J. C., and Guruprasanna Das. **Effect of temperature on phototropic curvatures.** Trans. Bose Res. Inst. Calcutta 2: 388–396. *Fig. 145–147.* 1919.—Rise of temperature within limits enhances the general excitability, and with it the positive phototropic curvature. However, the concomitant expansive reaction tends to oppose the positive curvature, and increased conductivity helps its neutralisation and reversal. Tendrils of *Passiflora* supposed to be insensitive exhibit positive curvature at low and negtive at moderately high temperatures. The effect of rise of temperature persists long after return to normal. The change of phototropic curvature from positive in autumn to negative in summer, as exhibited by *Tropaeolum majus* and ivy, is supposed to be due to these complex effects of temperature. The physiological effects of rise of temperature and of stimulus of light are shown to be antagonistic.—*B. Sen.*

7993. Bose, J. C., and Guruprasanna Das. **Mechanotropism: twining of tendrils.** Trans. Bose Res. Inst. Calcutta 2: 288–300. *Fig. 102–106.* 1919.—From records of the effect of direct and indirect stimulation, both electrical and mechanical, it is shown that the response of tendrils is in no way different from that of growing organs in general. Direct stimulus induces an incipient contraction. The after-effect of a feeble stimulus is an acceleration of growth above the normal; indirect stimulus enhances this acceleration. Under direct mechanical stimulus of short duration tendrils exhibit positive curvatures, the directly stimulated proximal side undergoing contraction and the distal side expansion, even when the contractility of the stimulated side is feeble. Indirect stimulation induces negative curvature. Both sides of tendrils of *Passiflora* are excitable, that of the under side being about 7 times greater than the upper. By simultaneous stimulation of both sides, the effects of direct and indirect stimulation on the more excitable side could be made to neutralise each other.—*B. Sen.*

7994. Bose, J. C., and Guruprasanna Das. **On galvanotropism.** Trans. Bose Res. Inst. Calcutta 2: 301–304. *Fig. 107–108.* 1919.—A feeble anodic current is shown to enhance the rate of growth; a feeble cathodic current retards it. Strong currents, both anodic and cathodic, retard the rate of growth.—*B. Sen.*

7995. Bose, J. C., and Guruprasanna Das. **On geotropic torsion.** Trans. Bose Res. Inst. Calcutta 2: 503–508. *Fig. 179–183.* 1919.—The direction of incident geotropic stimuli being the same as the direction of the vertical lines of gravity, the upper side of an organ undergoes effective stimulation. Under unilateral action of gravity a dorsiventral organ undergoes torsional response by which the less excitable half of the organ is made to face the stimulus. The effect of gravity and of light can be summated and also made to balance each other exactly by acting simultaneously on the 2 antagonistic sides. Slight variation in either of the opposing stimuli upsets this balance which determines the relative effects of external agents on geotropic and phototropic excitabilities.—*B. Sen.*

7996. Bose, J. C., and Guruprasanna Das. **On photonastic curvatures.** Trans. Bose Res. Inst. Calcutta 2: 378–387. *Fig. 140–144.* 1919.—The mechanics of photonastic curvatures is explained. There is no line of demarcation between tropic and nastic movements. In a differentially excitable organ the effect of a strong unilateral stimulus becomes internally diffused; the resulting curvature is determined by the more excitable side. In the absence of transverse conductivity (leaflets of *Erythrina indica* and *Clitoria ternatea*) or when light strikes the more excitable side (upper leaflet in *Mimosa*) or lower in *Biophytum* and *Averrhoa*), positive curvature reaches the maximum without neutralization or reversal. —*B. Sen.*

7997. Bose, J. C., and Guruprasanna Das. **Radio-thermotropism.** Trans. Bose Res. Inst. Calcutta 2: 410–415. *Fig. 151–152.* 1919.—Thermal radiation acts as a stimulus. Under unilateral application of thermal radiation positive curvature is induced from which there is a complete recovery and repeated responses similar to that of pulvinated organs could be obtained. Factors which determine dia- and negative curvatures are the same as in photic stimulation. In phototropic curvatures induced by sunlight the dark heat rays play as important a part as the more refrangible rays of the spectrum.—*B. Sen.*

7998. Bose, J. C., and Guruprasanna Das. **Tropic curvature with longitudinal transmission of effect of stimulus.** Trans. Bose Res. Inst. Calcutta 2: 271–278. *Fig. 98–99.* 1919. Light and thermal radiations were used as stimuli. Flower buds of *Crinum* and stems of *Dregea volublis*, when subjected to a unilateral stimulus of moderate intensity below the clamped portion, that is, where indirectly stimulated, exhibit negative curvature. On the other hand, when stimulated above the clamp on the free curving region they exhibit positive curvature. A strong stimulus applied indirectly produces 1st a negative curvature, followed by a positive one due to longitudinal transmission of excitation.—*B. Sen.*

7999. Bose, J. C., and Guruprasanna Das. **Tropic curvature with transverse transmission of effect of stimulus.** Trans. Bose Res. Inst. Calcutta 2: 279–287. *Fig. 100–101.* 1919.—Movement of a Mimosa pulvinus is used as the turgor indicator, increase in turgor inducing erection; and decrease, fall of the leaf. Both photic and electric stimuli of moderate intensity, applied unilaterally on the stem opposite the pulvinus, induce increase of turgor on the distal pulvinus, with resulting erection of the leaf. Stimuli of stronger intensity or longer duration induce 1st an erectile response, followed by fall of leaf brought on by the effect of excitation transversely conducted across the stem to the pulvinus. In semi-conducting tissues unilateral stimulation is shown to induce a positive curvature by the joint effects of contraction of the directly stimulated proximal side and expansion of the indirectly stimulated distal side. Under strong or long continued stimulation the excitation from the proximal side is transmitted to the distal, inducing neutralization or reversal, depending on the relative excitability of the two sides.—*B. Sen.*

8000. Bose, J. C., and Surendra Chandra Das. **On phototropic torsion.** Trans. Bose Res. Inst. Calcutta 2: 397–409. *Fig. 148–150.* 1919.—The mechanics of torsional movements are explained and the method of automatic recording is described. All forms of stimuli—photic, chemical, thermal radiation, and gravity—acting unilaterally on a dorsiventral organ induce torsional movements determined by the relative excitabilities of the 2 flanks and the direction of the incident stimulus. The induced torsion is such that the less excitable side is made to face the stimulus. From the responsive torsion of a dorsiventral organ, the direction of incident stimulus may be determined. It is shown that by the torsional balance method described, excitatory efficiencies of 2 different stimuli can be compared by letting them act simultaneously on the 2 flanks.—*B. Sen.*

8001. Bose, J. C., and Surendra Chandra Das. **On thermonastic phenomena.** Trans. Bose Res. Inst. Calcutta 2: 305–312. *Fig. 109–111.* 1919.—A thermonastic recorder is described by means of which the surrounding temperature and movements of petals could be automatically recorded. Two types of thermonastic movements, *positive* (of petals of *Crocus* and *Zephyranthes*) and *negative* (of petals of *Nymphaea*), are due, respectively, to the greater excitability of the inner and outer halves. Rise of temperature induces greater expansion of the more excitable half, and fall of temperature induces the opposite effect; these effects determine the resulting movement. Thermal radiation, as distinct from rise of temperature, acts as a stimulus whose effect is antagonistic to that of rise of temperature. *B. Sen.*

8002. Bose, J. C., and Surendra Chandra Das. **The relation between the quantity of light and the induced phototropic curvature.** Trans. Bose Res. Inst. Calcutta 2: 338–345. *Fig. 122–129.* 1919.—Both in growing and in pulvinated organs it is shown that increasing intensity or duration of light produces increasing tropic curvature and is approximately proportional to sine θ, where θ is the angle made by the rays with the responding surface. The intensity of induced tropic effect is determined by the quantity of incident light.—*B. Sen.*

8003. Bose, J. C., and Satyendra Chandra Guha. **Geo-electric response of root.** Trans. Bose Res. Inst. Calcutta 2: 467–477. *Fig. 172–173.* 1919.—Roots subjected to the stimulus of gravity exhibit on the upper side galvanometric negativity at the tip and positivity at the growing region. On the lower side the opposite effects are induced. It is shown that in contrast to the growing region of a shoot which both perceives and responds to geotropic stimulus, it is the root tip which perceives and the growing region behind which responds; therefore, their responses are of opposite signs.—*B. Sen.*

8004. Bose, J. C., and Satyendra Chandra Guha. **Geo-electric response of shoots.** Trans. Bose Res. Inst. Calcutta 2: 442–460. *Fig. 164–169.* 1919.—The effect of any direct stimulus is to produce galvanometric negativity; of indirect stimulus, positivity. When the electric response to geotropic stimulus is studied by the 2 methods of axial and vertical rotation, the upper side of a horizontally laid shoot is found to undergo an excitatory change of galvanometric negativity. In vigorous *Tropaeolum* the latent period is about 5 seconds and the maximum excitation is induced in the course of 2 minutes; the lower ½ of the Mimosa pulvinus is geotropically more excitable than the upper ½. The intensity of response declines with age and is abolished at death. Under symmetrical conditions, the intensity of geotropic reaction is shown to be proportional to the sine of the angle of inclination.—*B. Sen.*

8005. Bose, J. C., and Satyendra Chandra Guha. **Localisation of geo-perceptive layer by means of the electric probe.** Trans. Bose Res. Inst. Calcutta 2: 478–502. *Fig. 174–178.* 1919.—A new method of electric investigation by means of the electric probe is described, which enables measurements of electric reactions to be made at different layers of a tissue subjected to stimulus of gravity. It is shown that the induced galvanometric negativity of the successive upper layers progressively increases, attains a maximum, then undergoes decline, the maximum being invariably at the starch-sheath containing large sized grains. This sheath is identified as the geo-perceptive layer. On the other hand, the reactions on the lower layers show similar variations of galvanometric positivity, the maximum being at the perceptive layer. In vigorous specimens the galvanometric negativity of the upper side is greater than the positivity of the lower. The power of geo-perception undergoes seasonal variation, and is lowered by high temperature and by subtonicity of the tissue. —*B. Sen.*

8006. Bose, J. C., and Lalit Mohan Mukherji. **Daily movements in plants due to thermo-geotropism.** Trans. Bose Res. Inst. Calcutta 2: 554–568. *Fig. 199–204.* 1919.—The diurnal records of an inclined palm, geotropically curved *Tropaeolum,* and the dia-geotropic leaf of a palm show that they follow the temperature curve very closely, exhibiting an erectile movement from thermal-noon to thermal-dawn and a movement of fall from thermal-dawn to thermal-noon. Thermonastic movement is exhibited only by growing organs, while fully grown organs, including rigid trees, exhibit thermo-geotropic movements. By artificial temperature variations the diurnal rhythm could be reversed and, under constant temperature, periodic movements abolished.—*B. Sen.*

8007. Bose, J. C., and Lalit Mohan Mukherji. **Diurnal movement due to alternation of light and darkness.** Trans. Bose Res. Inst. Calcutta 2: 535–545. *Fig. 190–194.* 1919.—In the leaflet of *Cassia* a rise of temperature with darkness produces closure, a fall of temperature with light produces an opening movement. The opened day position is due to light overpowering the temperature effect. A closing movement begins at 5 p.m., when light undergoes rapid diminution, and is completed by 9 p.m.—the leaflet remaining closed until about 5 a.m. and expanding fully by 9 a.m. The terminal leaflets of *Desmodium gyrans* exhibit a similar movement. The midday sleep of leaflets of *Mimosa* and *Averrhoa* is due to a predominant contraction of the more excitable ½ of the pulvinule which is above in *Mimosa* and below in *Averrhoa.*—*B. Sen.*

8008. Bose, J. C., and Jyotiprakash Sircar. **The transmitted effect of photic stimulation.** Trans. Bose Inst. Calcutta 2: 362–377. *Fig. 135–139.* 1919.—The effect induced by the stimulus of light is transmitted to a distance precisely in the same manner as in other modes of stimulation. In Paniceae the local unilateral stimulation of the cotyledon tip induces in the hypocotyl below (which becomes indirectly stimulated) a negative curvature due to the positive impulse, which is subsequently reversed to a positive curvature by the

excitatory negative impulse. Contrary to the generally accepted view, it is shown that the hypocotyl not only perceives but responds to light; the positive curvature induced by direct stimulation is, however, neutralized by transverse conduction.—*B. Sen.*

8009. Guttenberg, Hermann von. **Studien über den Phototropismus der Pflanzen.** [Phototropism of plants.] Beiträge Allg. Bot. 2: 139–247. *Fig. 1–15.* 1922.—These studies are divided into the following groups: (1) Dependence of the phototropic reaction on the size of the illuminated surface, (2) studies on the perception process, (3) the stimulation value of light from an oblique direction, and (4) determination of the presentation-time when light strikes the plant from different angles.—*Orton L. Clark.*

8010. Guttenberg, Hermann von. **Über das Verhalten von Hypokotylen bei schräger Beleuchtung.** [Reaction of hypocotyls to oblique illumination.] Beiträge Allg. Bot. 2: 547–556. 1923.—Phototropic sensitization of Brassica hypocotyls is independent of the direction of light rays but is determined by the amount of light which penetrates into the interior of the plant. This amount varies with the sine of the angle at which the light strikes the plant The author opposes the "direction theory" and supports the "intensity theory" as determining the direction of phototropic curvature.—*Orton L. Clark.*

8011. Liese, Johannes. **Über den Einfluss der Lichtrichtung auf die Orientierung der Assimilationszellen.** [Influence of light direction on the orientation of assimilation cells.] Beiträge Allg. Bot. 2: 323–362. *Fig. 1–15.* 1922.—A number of plants which show a distinct response of the assimilation cells to a light stimulus were studied, the cells responding by changes of position until they were parallel to the direction of the light stimulus. *Fegatella conica, Marchantia polymorpha,* and *Begonia maculata* were the plants principally used.—*Orton L. Clark.*

8012. Mameli, Eva, ed Eligia Cattaneo. **Sul geotropismo negativo spontaneo di radici di Helianthus annuus e di alcune altre piante.** [Spontaneous negative geotropism of the roots of Helianthus annuus and some other plants.] Atti. Ist. Bot. Univ. Pavia Ser. II, 17: 9–20. 1920.—Physiological and anatomical examinations of roots of seedlings of *Helianthus annuus* var. *gigantie di Russia* showing 26–29% of spontaneous negative geotropism, verify the statolithic theory of Haberlandt and Nemec. Numerous microscopic examinations show that in such cases the calyptra assumes an obtuse and heavier form than in cases of positive geotropism and that it manifests an arrested growth. The central cells of the calyptra entirely lack starch. Previous to a new orientation of the rootlet (diageotropism or positive geotropism) starch grains appear. Starch in such cases always occupies the physically lower part of the cell. These experiments prove also that in *Helianthus annuus* the end of the root is the seat of geotropic sensitivity. The orientation of the seed during germination and the light and humidity, although not the cause, exercise an influence on the percentage of negative geotropism; temperature, age of the seed and nature of substratum do not. Negative geotropism is attributed to physiological causes affecting certain seed during ripening and germination. Negative geotropism (2–3%) was also observed in germinating seed of *Raphanus sativus, Helianthus Californicus, H. argophyllus, H. debilis, H. doronicoides,* and *Cucurbita Pepo.* It was not observed in the following species: *Vicia faba, Daucus carota, Reseda odorata, Sinapis alba, Cucumis Melo, Cichorium intybus, Vicia sativa, Viola tricolor, Fumaria officinalis, Saponaria officinalis, Helianthus Nuttallii, H. diffusus, H. occidentalis, H. mollis, H. giganteus, H. decapetalus, H. trachelifolius,* and *H. orgyalis.*—*P. D. Caldis.*

8013. Werdermann, Erich. **Können transversalphototropische Laubblätter nach Zerstörrung ihrer oberen Epidermis die Lichtrichtung perzipieren?** [Can transversally phototropic leaves perceive the direction of light after destruction of the upper epidermis?] Beiträge Allg. Bot. 2: 250–275. *Fig. 1–2.* 1922.—The experiments of Nordhausen, who opposed the theory of Haberlandt that the epidermal lens cells perceive light direction, were repeated and amplified. The author holds that Nordhausen's conclusion that "the leaf of *Begonia* perceives a light stimulus without the aid of the epidermis and places itself in a fixed light position," is not justified by the results of carefully controlled experiments.—*Orton L. Clark.*

GERMINATION, RENEWAL OF ACTIVITY

8014. Knudson, Lewis. **Further observations on nonsymbiotic germination of orchid seeds.** Bot. Gaz. 77: 212–219. *3 fig.* 1924.—Further evidence is here presented to prove that

the germination of orchid seed is dependent upon an outside source of organic matter. When glucose or sucrose were added to Pfeffer's solution, germination took place in some 8 genera, the germination being practically 100%. In the presence of lactose no germination occurred. In the absence of sugar the chlorophyll-bearing embryos are believed to be unable to carry on photosynthesis because of the lack of some internal factor necessary to the process. Embryos grown with the aid of sugar to the stage in which the leaf point is just appearing, may be thereafter grown on a non-organic medium since normal photosynthesis then occurs.—*B. W. Wells.*

REGENERATION, CORRELATION

8015. Goos, Hermann. **Über das anatomische und physiologische Verhalten eines einzelnen Laubblattes nach Ausshaltung der übrigen Assimilationsorgane. [Anatomical and physiological conduct of a single leaf after the inactivation of the other organs of assimilation.]** Beiträge Allg. Bot. 2: 500–546. *Fig. 1–12.* 1922.—A single leaf, after removal or darkening of remaining leaves, shows an adaptation for greater assimilatory activity by a strongly increased development of palisade tissue. This occurs either by an elongation of already existing cells or by an increase in the layers of palisade cells, or both. There was an increase in the number of chloroplasts but not in their size. The dry weight of the isolated leaf was much greater than that of the check leaf. Transpiration was increased 40% per unit of area over the check but no difference per gm. of fresh weight was found. Certain anatomical differences between isolated and normal leaves are also described.—*Orton L. Clark.*

8016. Kotte, Walter. **Kulturversuche mit isolierten Wurzelspitzen. [Experiments on the culture of isolated root tips.]** Beiträge Allg. Bot. 2: 413–434. *Fig. 1–4.* 1923.—Root tips 1 mm. long were transferred in a sterile condition to a suitable nutrient solution where an increase of 10–14 times the original length took place. Root hairs were formed after 2–3 days on root tips 2 mm. long. The isolated meristematic root tip is, in its developmental possibilities, independent to a large degree of the organism as a whole.—*Orton L. Clark.*

8017. Montemartini, Luigi. **Intorno ad alcuni casi di simbiosi autumnale locale e temporanea. [Cases of autumnal local and temporary symbiosis.]** Atti Ist. Bot. Univ. Pavia Ser. II, 17: 21–27. 1920.—Parts of the leaf of *Acer platanoides* attacked by *Uncinula Aceris* (D.C.) Sacc. remain green in the fall long after the rest of the leaf has turned yellow and died. The effect of *Phyllactinia suffulta* (Reb.) Sacc. on *Corylus avellana* is similar. There is a greater quantity of both dry matter and ash in the part of the leaf remaining green through the action of the parasite, than in a corresponding part which turned yellow. The difference increases until the green spots die. The author finds that at this time the parasite invades the cells of the mesophyll, and he concludes that an ectophytic fungus may, under certain conditions of temperature and humidity and perhaps as a result of decreased resistance in the host, become endophytic. In such a case its virulence is decreased and instead of killing the invaded tissues, it stimulates them. The phenomenon is designated as a local temporary symbiosis.—*P. D. Caldis.*

TEMPERATURE RELATIONS

8018. Bose, J. C., and Lalit Mohan Mukherji. **Diurnal movement due to variation of temperature affecting growth.** Trans. Bose Res. Inst. Calcutta 2: 546–553. *Fig. 195–198.* 1919.—The diurnal record shows that the perianth leaves of *Nymphaea* begin to open in the evening with falling temperature, the flower being fully expanded by 10 P.M. The closing movement sets in with rising temperature in the morning, being completed by 10 A.M.—*B. Sen.*

8019. Ludwig, Fleischer, and S. Amster. **Über den Einfluss des Mediums auf die Resistenz der Bacterien. Desinfectionsversuche mit Hitze. [Influence of the medium on the resistance of bacteria to disinfection by heat.]** Zeitschr. Hygiene u. Infectionskrankh. 99: 209–220. 1923.—Suspensions of *Bacterium coli* in various media were exposed to a constant temperature of 52°C. Compared to suspensions in distilled H_2O, those in lactose, sucrose, gelatin, peptone, tannin, $AlCl_3$, alum, and formaldehyde showed an increased resistance to heat. Inorganic salts in concentrations greater than N/10 decreased the heat resistance

of the bacteria. Data are included on the effect of different H-ion concentrations. A colloidal change in the cell membrane of the bacteria is given as an explanation.—*W. H. Chambers.*

8020. Shull, Charles A., and S. P. Shull. **Temperature coefficient of absorption in seeds of corn.** Bot. Gaz. **77**: 262–279. *1 fig.* 1924.—Using methods described in a former paper the authors find the temperature coefficient of absorption by grains of corn to average 1.537 over a range of 50° from 5°–55°C. As the increasing rate of absorption with temperature rise is only about $\frac{1}{8}$ as great as would be expected on the basis of the water simplification theory, this conception is rejected as an explanation of the influence of temperature on absorption. The velocity of intake at any given moment is an inverse exponential function of the amount of water previously absorbed. Irregularities in specific objects are considered, and the influence of semipermeability of seed coats on absorption phenomena is discussed. —*Charles A. Shull.*

RADIANT ENERGY RELATIONS

8021. Bose, J. C., and Surendra Chandra Das. **The after-effect of light.** Trans. Bose. Res. Inst. Calcutta **2**: 569–575. *Fig. 205–209.* 1919.—The after-effect of light is modified by the duration of exposure. Under continued action the galvanometric negativity attains a maximum, after which it undergoes decline and neutralization. Both electric and mechanical responses show that the immediate effect on stoppage of pre-maximal stimulus is a temporary continuation of response followed by recovery; that of maximum, a recovery to the normal equilibrium; and of the post-maximum, an "over-shooting" below the position of equilibrium.—*B. Sen.*

8022. Eaton, Frank M. **Assimilation-respiration balance as related to length of day reactions in soy beans.** Bot. Gaz. **77**: 311–321. *Fig. 1–4.* 1924.—The time of flowering of Peking soy beans given high, low, and uncontrolled nightly temperatures was affected to an extent comparable with the differences brought about by varying the length of day. It was found by measurements that respiration proceeded almost twice as rapidly under hot night conditions as under cold night conditions. Depriving soy beans of CO_2 for a number of hours of the day did not affect the time of flowering. However, attention should be directed to the fact that these plants from a growth standpoint were comparable to plants receiving a short day; both were greatly reduced as compared to plants receiving a long day. Not all short day plants gave the same reactions to varied nightly temperatures. The elongation of maize during the night was found to be nearly proportional to the temperature.—*F. M. Eaton.*

8023. Moore, Howard R., and W. Albert Noyes, Jr. **Photochemical studies. 2. The activation of a mercury surface by light. A possible relationship between photoelectric effect and photochemical action.** Jour. Amer. Chem. Soc. **46**: 1367–1376. 1924.

TOXIC AGENTS

8024. Bonacorsi, L. **Über den Einfluss der Reaktion des Nährbodens auf die entwicklungshemmende Wirkung chemisher Substanzen. [Influence of the reaction of the media on the growth-inhibiting action of chemicals.]** Zeitschr. Hygiene u. Infectionskrankh. **99**: 284–295. 1923.—Within the pH ranges for optimum growth of *Bacterium rhusiopathiae suis*, *Bacterium coli*, *Staphlococcus pyogenes aureus*, *Bacterium anthracis*, and *Bacterium pyocyaneus* various inhibiting chemicals such as $CuSO_4$, neosalvarsan, etc., were tested. Growth varied according to the species of bacteria, the chemical inhibitor, and the pH of the medium. Differences in pH not only changed the dissociation constant of the chemical, but also the permeability of the bacteria.—*W. H. Chambers.*

8025. Dustman, R. B. **Effect of potassium acid phthalate on early growth of tomato plants.** Bot. Gaz. **77**: 419–431. *Fig. 1–6.* 1924.—Concentrations of the reagent ranging from 200–10,000 parts per million were tried. The nutrient solutions or the soil media were not controlled after the experiments were started. Definite injury occurred with a concentration of 1000 or more parts per million. As measured by dry weight increases in plants grown in sand cultures, its toxic action is appreciable in concentrations of 500 parts per million or less. When applied to soil cultures the opposite effect may occur, and the addition of the phthalate

may prove beneficial to the growth of the plants. Barley plants appeared somewhat more susceptible to phthalate injury than tomato plants.—*B. W. Wells.*

8026. Kelley, Arthur Pierson. **Smoke and soil acidity.** Bot. Gaz. 77: 335–399. *Fig. 1–2.* 1924.—Upon testing various soils in the factory region of South Philadelphia for possible increase in acidity from smoke sources, it was determined that the geographical distribution of acidity is not correlated with the presence of smoke. One soil which was almost constantly under smoke from adjoining railroad yards maintained under cultivation a pH of 7.0.—*B. W. Wells.*

SOIL SCIENCE

A. G. McCall, *Editor*

(See also in this issue Entries 7502, 7505, 7507, 7517, 7519, 7520, 7524, 7525, 7527, 7529, 7551, 7569, 7638, 7661, 7747, 7930, 7958, 8025, 8026)

8027. Aberson, J. H., en Frida Eversmann. **Mededeelingen van het Landbouwkundig Laboratorium der Landbouwhoogeschool.** [Communications from the Agricultural Chemical Laboratory of the Agricultural College.] Landbouwk. Tijdschr. 1: 161–173. 1924.—Various experiments were conducted with oats, buckwheat, peas, and clover to determine the fertilizing value of radioactive substances. The conclusion was reached that U cannot take the place of K. Therefore the physiological function of K cannot be exclusively radioactive. So called "humus-fertilizers" which are recommended as combining the properties of barnyard and chemical fertilizer and which are claimed to function as catalizers in the soil proved to be of no value.—*J. C. Th. Uphof.*

8028. Auten, J. T. **Organic phosphorus of soils.** Soil Sci. 16: 281–294. 1923.—Determination of organic P by the Potter and Benton method shows that it exists in large amounts in soils but not in any considerable amount as nucleic acid, phytin, lecithin or pyrimidine nucleotides. Organic P compounds added to soils are probably hydrolyzed and the inorganic P is combined in a Ca-Mg or other metal salt of an organic amphoteric complex.—*W. J. Robbins.*

8029. Blair, A. W., and A. L. Prince. **The influence of the nitrogen treatment on the content of nitrogen, carbon and phosphoric acid in a soil varying in mechanical composition.** Soil Sci. 16: 115–119. 1923.—To a loam soil in cylinders different amounts of coarse sand were added. Liberal applications of acid phosphate, KCl and lime were made to all cylinders; 2 received no N, 2 received annually 320 pounds of $NaNO_3$ per acre; and 2 received an equivalent amount of N in dried blood. After 10 years cropping the total differences in the amounts of N, the C, and the PO_4 in the soil in the 3 sets of cylinders were found to be slight.—*W. J. Robbins.*

8030. Carleton, Everett A. **A comparison of the Jones calcium acetate method for lime requirement with the hydrogen-ion concentration of some Quebec soils.** Soil Sci. 16: 79–90. *2 fig.* 1923.—Good agreement between the electrometric and the colorimetric methods of determining the pH values of 51 Quebec soils was obtained. A general correlation exists between H-ion concentration and lime requirement as determined by the Jones method. The Jones method gives a lime requirement for neutral and slightly alkaline soils. Soils treated with lime water in amounts indicated by the Jones method are in general close to neutrality.—*W. J. Robbins.*

8031. Carleton, Everett A. **The litmus method for detecting the soil reaction.** Soil Sci. 16: 91–94. 1923.—The litmus paper test depends upon the H-ion concentration of the soil. The 3 shades of color assumed by blue litmus paper in contact with soils may be roughly described as pink, slightly pink, and very slightly pink corresponding to pH values of 4.8–5.2, 5.2–5.8 and 5.8–6.7, respectively. The changing of the color of red litmus does not mean that a soil is basic unless the blue color is imparted to the paper.—*W. J. Robbins.*

8032. Gedroiz, K. K. **The hydrochloric acid method for determining in the soil the cations present in an adsorbed condition.** Soil Sci. 16: 473–474. 1923.—From 5 to 25 gm. of soil are treated in the cold with 25–50 cc. of 0.05 N HCl in a small porcelain dish, transferred

to a hardened filter and washed with the same acid until the filtrate shows no Ca. The filtrate is evaporated to dryness, with the addition of some HNO_3, and the organic matter is destroyed by aqua regia; the residue is dried for 30 minutes at 125–150°C., dissolved in warm dilute HCl and the SiO_2 filtered off. The bases are then determined.—*W. J. Robbins.*

8033. Greaves, J. E., and E. G. Carter. **Influence of sodium arsenite on microflora of soil.** Bot. Gaz. 77: 63–72. 1924.—By adding sodium arsenite in solution to soils of 3 types, the influence on the total number of organisms, on the ammonifiers and on the nitrifiers was tested. The soils used were a fine sand, a silt loam with low N content, and the same loam manured for 15 years. Results show that sodium arsenite applied to a soil greatly increases the number of organisms which will develop on synthetic agar. In 3 dilute concentrations the ammonifiers were stimulated by the addition of sodium arsenite. The soil in which stimulation was noted was a calcareous loam, high in organic content. If the number of ammonifiers in a soil is increased by the addition of sodium arsenite, their physiological efficiency is reduced to such an extent that there is a decrease in the accumulation of NH_3 over that found in an untreated soil. Sodium arsenite is toxic to nitrifiers when added to a soil in only 1 part per million, whereas even 85 parts per million of As in the form of sodium arsenate stimulates. Sodium arsenite is less toxic to ammonifiers and nitrifiers in a loam soil than in a sand, and still less toxic in an organic loam than in a silt loam. The organic colloid probably forms a loose chemical combination with the As, thus protecting the bacterial flora against its action. Although comparatively large quantities of arsenates may accumulate in a soil without injuring its beneficial microflora, only small quantities of sodium arsenite may accumulate without producing ill effects.—*I. V. Shunk.*

8034. Greaves, J. E., C. T. Hirst, and Yeppa Lund. **The leaching of alkali soil.** Soil Sci. 16: 407–426. 1923.—A productive calcareous silt loam soil was made into an alkali soil by treatments with NaCl, Na_2SO_4, and Na_2CO_3. In addition, 3 natural alkali soils were used, 1 high in SO_4, 1 high in Cl and 1 high in CO_3. When leached in 2-gallon jars, Na_2SO_4 was readily removed from the soil and NaCl was also readily leached. Soil treated with Na_2CO_3 leached slowly and the amount of CO_3 recovered was less. It was impossible to leach enough Na_2CO_3 from the soil to permit crops to be grown. The alkali salts greatly increased the lime and P removed from the soil. The K content of the treated soils was 1.5–3.8 times that of the untreated, the N content 2.2–9.1, and the C content 1–4.5. Leaching alkali soils makes them unproductive because of the leaching of much readily available plant-food, the production of a poor state of tilth, and sometimes the development of a toxic Mg-Ca ratio.—*W. J. Robbins.*

8035. Halversen, W. V., and W. B. Bollen. **Studies on sulfur oxidation in Oregon soils.** Soil Sci. 16: 479–490. *2 fig.* 1923.—All soils tested oxidized Na_2S and S flour. A general relation exists between sulphofying power and SO_4 content but none between total S content and SO_4 content. Application of S to soil, and increase in temperature and aeration enhance sulphofication. No apparent relation exists between the H-ion concentration and S oxidizing power of a soil.—*W. J. Robbins.*

8036. Hibbard, P. L. **Comparison of the soil solution by displacement method and the water extract of alkali soils.** Soil Sci. 16: 465–471. 1923.—The data on 9 different alkali soils indicate that in the water extract SO_4, K, CO_3, H_2CO_3, and PO_4 are greatly overestimated; Cl, NO_3, and Na may be approximately correct; and Ca and Mg may be too high or too low as compared with the amounts in the solution secured by displacement. The actual concentration of solutes in the soil solution may be much greater than that calculated from the amounts found in 1–5 water extracts.—*W. J. Robbins.*

8037. Johnson, Harlan W. **A new apparatus for mechanical analysis of soils.** Soil Sci. 16: 363–366. *5 fig.* 1923.—An apparatus which automatically records the distribution curve of soil particles of different sizes is described. It is a modification of that of Sven Oden and is based upon the total weight of the soil particles settling from water suspension in a stated time interval.—*W. J. Robbins.*

8038. Kelley, A. P. **Soil acidity, an ecological factor.** Soil Sci. 16: 41–54. *2 fig.* 1923. Soil acidity determinations were made on a small area in Pennsylvania throughout the year and the results correlated with the plant growth. The acidity increases to a depth of about 15 cm. and then decreases. The increase is greatest in the most sterile soils. Excessive

drying and freezing increase acidity, while heavy rains lower it. Monthly tests indicate that there are slight variations from time to time in soil acidity. Absorbing roots were found chiefly in the least acid portions of soil. Mycorrhiza occur in the top 15 cm. of the more acid soils, becoming less abundant in the more nearly alkaline. Descriptions of consocies of the soil types indicate a correspondence between not only the facies, but the whole flora and its habitat.—*W. J. Robbins.*

8039. McCool, M. M., J. O. Veatch, and C. H. Spurway. **Soil profile studies in Michigan.** Soil Sci. 16: 95–106. 1923.—Analyses for the mineral elements, N, and organic matter; and determination of the true reaction, lime requirement, unfree water, and heat of wetting of many soils of the northern and southern group of Michigan soils are reported. The results are explained and an attempt is made to correlate these chemical and physical data with the visible phenomena in the field.—*W. J. Robbins.*

8040. McGeorge, W. T. **Acidity of highly basic soils.** Soil Sci. 16: 195–206. 1923.—The lime requirement or acidity by the Hopkins, Jones, Loew, Carr, Truog, Veitch, Hutchinson-MacLennan, Lyon-Bizzell, Conner, Rice-Ozugi, Hollermann, Immendorf, and H-electrode methods was determined for 14 Hawaiian soils high in oxides of Fe and Al. The data are used to interpret the nature of the soil acidity. In the humid districts acid-reacting organic matter is important. Mineral acidity is due in most part to Al salts and Al silicate, the latter predominating in humid districts. Fe is a factor only in the very acid soils—pH 4–6; while Mn is a factor only in those of pH 5.5–7.0. Water of combination or hydration is an important factor in all of the types of soil studied.—*W. J. Robbins.*

8041. MacIntire, W. H., W. M. Shaw, and J. B. Young. **A five year lysimeter study of the supposed liberation of soil potassium by calcic and magnesic additions.** Soil Sci. 16: 217–223. *1 fig.* 1923.—The influence of additions of limestone, dolomite, CaO and MgO on the leaching of K from 23 lysimeters over a 5-year period was determined. Treatments of $FeSO_4$, pyrite, and elemental S with and without lime and magnesia were also used. Every form and rate of calcic and magnesic treatment alone and with SO_4 depressed the K leached. Increased losses of K were obtained with the S carriers when used alone.—*W. J. Robbins.*

8042. MacIntire, W. H., W. M. Shaw, and J. B. Young. **Influence of calcic and magnesic treatments upon sulfate leachings from soil alone and with additions of ferrous sulfate, pyrite, and sulfur.** Soil Sci. 16: 159–182. *2 fig.* 1923.—SO_4 was determined in the leachings over a 5-year period from 22 lysimeter tanks of soil to which various forms and amounts of calcic and magnesic materials had been added together with 1000 pounds per acre of S as $FeSO_4$, pyrites and elemental S. The untreated tank lost less S than was received through rainfall. Treatments with CaO, MgO, limestone and dolomite at a 2000 pound CaO equivalent rate, and CaO and MgO at a 3750 pound CaO equivalent rate, increased the loss of SO_4 as compared to the control. Economic and equivalent applications of burnt lime, magnesia, limestone and dolomite were practically identical in their accelerative influences upon the SO_4 found in the leachings of soils treated with sulphur carriers. Small amounts of both lime and magnesia increased the SO_4 losses from the soil treated with powdered sulphur. Both lime and magnesia decrease the amounts of SO_4 lost from pyrite applications.—*W. J. Robbins.*

8043. MacIntire, W. H., W. M. Shaw, and J. B. Young. **Reciprocal repression exerted by calcic and magnesic additions upon the solubility of native materials in surface soil.** Soil Sci. 16: 449–464. 1923.—Leaching data from soils in 22 lysimeters for a 5-year period are given. The soils were treated with CaO, MgO, limestone, dolomite, $FeSO_4$, pyrite and elemental S. Limestone increased the Ca outgo and did not affect the Mg. CaO increased the outgo of Ca and decreased that of Mg, while dolomite and MgO had the opposite effect. $FeSO_4$, pyrite, and S increased the loss of Ca and Mg.—*W. J. Robbins.*

8044. MacIntire, W. H., W. M. Shaw, and J. B. Young. **The influence of calcic and magnesic additions upon the outgo of sulfates from a loam soil as measured by lysimeter leachings over an 8-year period.** Soil Sci. 16: 1–40. *8 fig.* 1923.—An 8-year study of annual SO_4 leachings from tanks containing surface soil and surface soil plus subsoil, as influenced by 9 different calcic and magnesic materials in different amounts, was carried out by the use of 46 field lysimeters. At the 8-ton rate, CaO, MgO, $CaCO_3$, $MgCO_3$, 100 mesh limestone, dolomite,

and magnesite materially increased the loss of SO_4 from the surface soil and to a less extent from the subsoil. At the 32-ton rate, CaO exerted a depressive effect in contrast to the activating effect of MgO and the carbonates. At the 100-ton rate, CaO was found to be exceedingly effective in stopping losses from the surface soil, but after the 4th year the heavy addition forced SO_4 from the subsoil zone. All other additions increased the surface soil losses. Unaltered subsoil stopped large amounts of SO_4 but an influx of Ca and Mg salts served to diminish or overcome this property. The SO_4 leached from the untreated soil was less than the amount brought to it by rainfall. The injudicious use of liming materials may rapidly impair the supply of S carried by the surface soil.—*W. J. Robbins.*

8045. MacIntire, W. H., W. M. Shaw, and J. B. Young. **The variant roles of soil and subsoil in calcium-magnesium interchange.** Soil Sci. 16: 321–341. 1923.—To surface soil and to surface soil underlaid by a 1-foot depth of clay subsoil in lysimeters, were added CaO, MgO, $CaCO_3$, $MgCO_3$, limestone, dolomite, and magnesite in chemical equivalence at the rate of 8, 32, and 100 tons of CaO per 2,000,000 pounds of moisture-free soil. Increase in additions of CaO increased the outgo of Ca salts from both surface soil and subsoil. Each lime addition depressed the outgo of native Mg from the surface soil and liberated it from the subsoil. Each MgO, $MgCO_3$ and magnesite treatment depressed the outgo of Ca from the surface soil and liberated more Ca from the subsoil than was leached from corresponding $CaCO_3$ additions. With $CaCO_3$, 2 of the 3 additions depressed the outgo of Mg from the surface soil and all increased its loss from the subsoil. The increases of dolomite increased the Ca but not the Mg losses. In general, where additions gave a preponderance of 1 alkali earth, the outgo of the other was depressed in the surface soil and accelerated in the subsoil.—*W. J. Robbins.*

8046. Martin, Thomas L. **Soil flora studies.** Soil Sci. 16: 475–477. 1923.—*Actinomyces*, spore formers and non-spore formers were determined on gelatin plates from soils in pots to which green manures had been added. The green manures increased the Actinomyces group most and affected the spore formers least.—*W. J. Robbins.*

8047. Millar, C. E. **Studies on virgin and depleted soils.** Soil Sci. 16: 433–448. 1923. —A study of 48 depleted soils and their corresponding virgin soils showed that the latter had the greater solubility as measured by the freezing point method. An equal or greater rate of solution was observed in several soils after removal of their organic matter by H_2O_2. The difference between cropped and virgin soils in rate of solubility after removal of the organic matter was generally greater than for the untreated samples. Using the displacement method of securing the soil solution a fair correlation was found for silt loam between the amounts of Ca and P and the response of plant growth to the addition of these elements, but for peat and sandy soils the correlations were not good. Extracting soils by 3 parts H_2O with a period of contact of 18 days, good correlations were found for silt loam and sandy soil for Ca and P and better correlations for K than by the displacement method. The total amounts of material found in the extracts agreed well with the growth of alfalfa on the plots. When the soils remain in contact with larger quantities of water (1–5 for mineral soils and 1–7½ for the peats) for 20 hours, the total amounts of material extracted agreed remarkably well with the yield of alfalfa on the untreated soils. Where large amounts of Ca went into solution and small amounts of P and K, growth of alfalfa was satisfactory, indicating that highly available Ca may render smaller amounts of P and K adequate.—*W. J. Robbins.*

8048. Miyake, Koji, and Ishio Tamachi. **On the nature of the acidity appearing after the addition of soybean cake to a rice field.** Jour. Biochem. Tokyo 3: 305–323. 1924.—Ten gm. of air-dry soybean cake were added to 200 gm. of air-dry soil plus 200 cc. of distilled H_2O in flasks plugged with cotton and kept at room temperature for 60 days, determinations being made at 10-day intervals upon composite samples from several flasks. Titratable acidity increased for 50 days, then fell off very slightly. The amount of H_2CO_3 increased steadily throughout the period, phosphoric acid and silicic acid reached their maxima on the 40th day, then gradually decreased, while H_2SO_4 increased until the 50th day, then decreased slightly. Volatile and non-volatile organic fatty acids increased in amount throughout the period, but the amount of free non-volatile fatty acids was much smaller than the volatile. NH_3, Al, Fe, Mn, and Ca increased in amount in the solution more rapidly than Mg, Na and K. Only very small amounts of these bases were dissolved out by distilled water alone. The solubility of

Al, Fe, Mn, Na, Ca, and silicic acid is increased by the decomposing organic matter. The titratable acidity developed in the soil solution during decomposition of organic matter, increased at equal rate with the solubility of the Al, Fe, and Mn. There were large amounts of organic acids in combination with NH_3 present in the solution. The amounts of phosphoric, silicic, and sulphuric acids were so small that they contributed very little to the total acid content of the solution.—*Joseph S. Caldwell.*

8049. Miyake, Koji, Michitaro Sugawara, and Koji Nakamura. **On the nature of the absorption of ammonia by soils.** Jour. Biochem, Tokyo 3: 283–304. 1924.—An attempt was made to determine whether the absorption of NH_3 by soils is primarily physical or chemical. NH_4Cl solutions of concentrations ranging from N/1 to N/300 were shaken with soil for 3 minutes and held 24 hours at 30°C. The amount of NH_3 adsorbed was determined by the difference between the original solutions and the supernatant liquid. The results agreed very closely with the values calculated from Freundlich's adsorption formula except in the case of the high concentrations. The supernatant solutions were also analyzed for their content of Fe, Al, Mn, Ca, Mg, K, and Na that had been displaced from the soil. The total amounts of these did not show agreement with the amounts of NH_3 adsorbed, nor did the determinations of acidity upon the solutions indicate that the exchange followed the law of mass action. The absence of a quantitative relation between loss of NH_3 and replacement of bases in the solution is due to the fact that NH_4Cl is a salt of a strong acid and a weak base, which becomes hydrolyzed in the solution, giving HCl which is largely dissociated, making the solution acidic, while the NH_4OH is very slightly dissociated, and is physically adsorbed as such. The HCl of the solution produces a secondary chemical reaction, dissolving the bases out of the soil. That the adsorption of NH_3 is a physical phenomenon is strongly indicated by the time factor, since it attains a maximum in 30 minutes. The release of bases into the solution continues slowly for 20–24 hours, Al and Fe dissolving out rapidly, Ca and Mg more slowly. Increase of temperature decreases the adsorption of ammonia, whereas an increase would occur if the process were chemical in nature.—*Joseph S. Caldwell.*

8050. Morse, F. W. **Comparative effects of muriate and sulfate of potash on the soil in a long continued fertilizer experiment.** Soil Sci. 16: 107–114. 1923.—Soil from 3 plots treated for 22 years with KCl has been compared with soil from 3 adjacent plots treated during the same time with K_2SO_4. It is concluded that the long continued use of the 2 salts produced no important cumulative differences in the chemical properties of this soil. KCl is possibly less exhaustive of lime in the soil than is K_2SO_4.—*W. J. Robbins.*

8051. Neidig, Ray E., and Harry P. Magnuson. **Equilibrium studies of sodium carbonates and bicarbonates in some Idaho soils.** Soil Sci. 16: 295–320. *6 fig.* 1923.—To 4 different soils 0.25—1.5% of Na_2CO_3 was added and the recoverable carbonate and bicarbonate determined at intervals over 2 years. Absorption increased rapidly to a constant value after the addition of the salts. The addition of fresh quantities of salts after equilibrium had been reached resulted in a new absorption similiar to that secured with the 1st addition. A greater absorption occurred with the greater concentrations of added salt. The 4 soils, assumed to be widely different, showed at equilibrium similiar capacities for absorption. It is suggested that some of the Na_2CO_3 generally assumed to be absorbed is in reality changed to other compounds.—*W. J. Robbins.*

8052. Neidig, Ray E., G. R. McDole, and H. P. Magnuson. **Effect of sulfur, calcium, and phosphorus on the yield and composition of alfalfa on six types of Idaho soils.** Soil Sci. 16: 127–136. 1923.—The effects of lime, S, $CaSO_4$ and P on the yield of alfalfa in pots and on the amount of soluble K in the water extract of the soil was studied. S produced an increase in the yield on soils from the humid portion of Idaho but not on those from the arid portion. S increased the total N removed by the alfalfa and the percentage of S in the plant. P increased the yield on all but 2 soils, the arid soils showing the greater response. The effect of the treatments on the solubility of the K varied with the soil type.—*W. J. Robbins.*

8053. O'Neal, A. M. **The effect of moisture on soil color.** Soil Sci. 16: 275–279. *Pl. 1.* 1923.—The colors of Clinton silt loam and Tama silt loam with 10, 20, 30 and 40% H_2O content are described. The color becomes darker up to 30% H_2O content.—*W. J. Robbins.*

8054. Parker, F. W., and J. W. Tidmore. **A modification of the Truog soil acidity test.** Soil Sci. 16: 75–78. 1923.—For research work it is suggested that the H_2S evolved in the test be absorbed in dilute NH_4OH. The addition of a standard I solution in excess and the titration of the I with $Na_2S_2O_3$ is suggested for the determination of the H_2S.—*W. J. Robbins.*

8055. Rost, Clayton O., and Ernest A. Fieger. **Effect of drying and storage upon the hydrogen-ion concentration of soil samples.** Soil Sci. 16: 121–126. 1923.—Soil samples from 5 fields showed differences in the pH value between fresh and air-dry samples varying from pH 0.03 to pH 1.17. Some samples became more acid and some more alkaline on drying but the majority became more acid. Of 144 glacial and loessial soils all except 1 became more acid on airdrying. The maximum difference, pH 1.17, was found with the group having a decidedly alkaline reaction. Air-drying of soil samples increased in most cases the intensity of the reaction obtained by the K thiocyanate method. Samples air-dried, moistened with distilled H_2O, and allowed to stand in the moist condition for a varying number of days were more acid than soils in the fresh condition. Oven-drying increased the acidity of all soils tested.—*W. J. Robbins.*

8056. Scofield, C. S. **Measuring the potential alkalinity of irrigated soils.** Jour. Washington (D. C.) Acad. Sci. 14: 192–194. 1924.—Samples of soils are tested in the laboratory by leaching with a definite quantity of a standard solution of $CaCl_2$. The quantity of alkaline bases obtained in solution indicates the potential alkalinity.—*Helen M. Gilkey.*

8057. Sjollema, B. **Bepaling van de waterstofionenconcentratie en van het zoogenaamd lufferend vermogen van zure gronden met enkelvoudige hulpmiddelen. [Determination of hydrogen ion concentration and of the so-called buffering capability of acid soils, with simple instruments.]** Landbouwk. Tijdschr. 1: 88–97. 1924.—Treatment of acid sand soils with neutral red, or salts of another weak base makes it easy to determine the acidity colorometrically, the pH values thus found agreeing well with determination by the H electrode. With the latter method as well as with neutral red, usually a higher H-ion concentration is found than in the water extracts of these soils. With this method it is possible to obtain more complete data concerning the condition of the soil as to H-ions than through the H electrode method. By the use of neutral red some idea may be obtained as to the condition of the base forming ingredients of the soil. Probably the neutral red method can be used in determination of the amount of exchangeable K, Ca, etc. in the soil.—*J. C. Th. Uphof.*

8058. Vandecaveye, S. C. **The liberation of potassium from feldspars, and of potassium and carbon dioxide from soils by fertilizer and acid treatments.** Soil Sci. 16: 389–406. *3 fig.* 1923.—A manure extract and a combination of manure and acids in moderate concentrations gave a decided increase in water-soluble K from finely ground orthoclase and alunite. Sterilization and the addition of acids, $CaCO_3$, and $CaSO_4$ did not increase the water-soluble K. Relatively small amounts of $CaSO_4$ increased the water-soluble K in Carrington loam, while $CaCO_3$ and KH_2PO_4 did not. Organic matter and a combination of organic matter and acids in sterile and non-sterile soil increased the water-soluble K, but the CO_2 produced was not an index of the water-soluble K liberated. Sterilization increased the amount of water-soluble K, the concentration of the soil solution, and the H-ion concentration of the soil. The reaction of the soil showed no relation to CO_2 production nor to liberation of K.—*W. J. Robbins.*

8059. Waksman, Selman A. **Microbiological analysis of soil as an index of soil fertility: VI, Nitrification.** Soil Sci. 16: 55–67. *1 fig.* 1923.—The nitrifying power of the soil from 9 plots and the bacterial numbers found in the same soils were compared with the crop yields of the plots. A correlation was found between nitrifying power and bacterial numbers and crop yields.—*W. J. Robbins.*

8060. Waksman, Selma A., and Robert L. Starkey. **Partial sterilization of soil, microbiological activities and soil fertility.** Soil Sci. 16: 137–157. *Pl. 1, 3 fig.* 1923.—The results obtained by the authors are in substantial agreement with those of previous investigators. The fungi are markedly repressed at 1st but soon develop. NH_3 accumulates in partially sterilized soils but may be used to some extent by the fungi. There is no correlation between increase in bacterial numbers and accumulation of NH_3 when soils containing different amounts of organic matter are compared.—*W. J. Robbins.*

8061. Waksman, Selman A., and Robert L. Starkey. **Partial sterilization of soil, microbiological activities and soil fertility: II.** Soil Sci. 16: 247–268. *16 fig.* 1923.—Soil was placed in pots and allowed to stand 11 months until the numbers of bacteria and fungi, CO_2 production, and NO_3 had become constant. At the end of this period the soils were subjected to various treatments. The CO_2 production was measured and the bacterial, fungous, and protozoan numbers and NO_3 and NH_3 content were determined at intervals. The addition of alfalfa hay to the soil produced changes in the microbiological activities much similar to partial sterilization treatments.—*W. J. Robbins.*

8062. Waksman, Selman A., and Robert L. Starkey. **Partial sterilization of soil, microbiological activities and soil fertility: III.** Soil Sci. 16: 343–357. 1923.—Soil in pots was left undisturbed or treated with toluene or CaO, and the numbers of microorganisms, NO_3 and NH_3 contents were determined at intervals; the nitrifying power and CO_2 production from added alfalfa hay, and the cellulose destroying power were also determined after the treatments. It is concluded that partial sterilization brings about a chemical change in the organic matter of the soil, making it more available as a source of energy for microorganisms. A large proportion of soil microorganisms are killed by partial sterilization and this material increases the amount of energy material. The rapid increase in the number of microorganisms in the soil is at the expense of the organic material made available. The actual amount of NH_3 formed in partially sterilized soil is determined not by the numbers of bacteria and fungi but by the abundance of organic matter. The protozoa are suppressed in partially sterilized soil, but become active again long before the bacterial numbers drop very markedly.—*W. J. Robbins.*

8063. Wherry, Edgar T. **The active acidity of soils.** Jour. Washington (D. C.) Acad. Sci 14: 207–211. 1924.—Active acidity is contrasted with total acidity, and methods of making determinations are reviewed. The importance in a soil survey of determining active acidity is emphasized.—*Helen M. Gilkey.*

TAXONOMY OF VASCULAR PLANTS

J. M. Greenman, *Editor*

E. B. Payson, *Assistant Editor*

(See also in this issue Entries 7515, 7565, 7581, 7582, 7583, 7586, 7636, 7637, 7652, 7672, 7783, 7923)

GENERAL

8064. Black, J. M. **Flora of South Australia. Part I. Cyatheaceae—Orchidaceae.** *Roy. 8vo, 154 p., 9 pl., 34 fig.* R. E. E. Rogers: Adelaide; Wheldon & Wesley: London, 1922.—The object of this flora is set forth in the preface, namely, "to assist students, plant-lovers, or persons engaged in pastoral or agricultural pursuits, who may wish to know something about the native and naturalized plants of the State." A history of botany in South Africa, followed by a glossary of botanical terms, precedes a key to the families. The present part includes the ferns, fern-allies, and flowering plants through the family of orchids. The Orchidaceae have been elaborated by R. S. Rogers. Keys are given to the genera, and when the genus contains 2 or more species a key is also provided for specific identification. The descriptive matter is supplemented by rather copious illustrations, particularly in the larger and more difficult groups. The following new varieties and combinations are included: *Stipa setacea* R. Br. var. *latiglumis*, *S. eremophila* Reader var. *dodrantaria*, *S. pubescens* R. Br. var. *comosa*, *Eriachne ovata* Nees var. *pedicellata*, *Danthonia penicillata* (Labill.) F. v. M. var. *setacea* (*D. setacea* R. Br.), *Diplachne fusca* (L.) Beauv. var. *Muelleri* (*D. Muelleri* Benth.), *Eragrostis eriopoda* Benth. var. *laniflora* (*E. laniflora* Benth.), *Leptochloa digitata* (*Eleusine digitata* Spreng.), *Cladium tetragonum* (*Lepidosperma tetragona* Labill.), *Dichopogon fimbriatus* (*Arthropodium fimbriatum* R. Br.), and *Moraea xerospatha* MacOwan var. *monophylla*.—*J. M. Greenman.*

8065. Gamble, J. S. **Flora of the Presidency of Madras.** Part VI. *P. 963–1160.* Adlard & Son and West Newman: London, 1924.—This part begins with the genus *Microcarpaea* of the Scrophulariaceae and continues to *Plantago* of the Plantaginaceae. The following new combinations are indicated: *Centranthera indica* (*C. procumbens* Benth.), *Utricularia Wallichiana* Wt. var. *macrolepis* (*U. macrolepis* Wt.), *Aeschynanthus planiculmis* (*A. Perrottetii* A. DC. var. *planiculmis* [by error *platyculmis*] C. B. Clarke), *Didymocarpus Wightii* (*D. Rottleriana* var. *Wightii* C. B. Clarke), *Thunbergia fragrans* Roxb. var. *hispida*, *Hemigraphis latebrosa* Nees var. *incana*, *Eranthemum montanum* Roxb. vars. *Wightianum* and *concanense*, *Strobilanthes humilis* (*Endopogon viscosus* var. *humilis* Wt.), *S. luridus* Wt. var. *Bourneae*, *Andrographis producta* (*A. Neesiana* var. *producta* C. B. Clarke), *A. explicata* (*A. viscosula* var. *explicata* C. B. Clarke), *Gymnostachyum latifolium* T. And. var. *decurrens*, *Pseuderanthemum malabaricum* (*Eranthemum malibaricum* C. B. Clarke), *Lepidagathis subarmata* (*L. mitis* var. *subarmata* C. B. Clarke), *L. Barberi* (*L. pungens* Wt., not Nees), *Rungia parviflora* Nees var. *monticola*, *Justicia serpyllifolia* (*J. simplex* var. *serpyllifolia* C. B. Clarke), *J. latispica* (*J. procumbens* var. *latispica* C. B. Clarke), *J. prostrata* (*J. diffusa* var. *prostrata* C. B. Clarke), *Premna paucinervis* (*P. purpurascens* var. *paucinervis* C. B. Clarke), *Anisochilus dysophylloides* Benth. var. *purpureus* (*A. purpureus* Wt.,), *Pogostemon nilagiricus* (*P. rotundatus* Wt., not Benth.) *Leucas biflora* R. Br. var. *procumbens* (*L. procumbens* Desf.), and *L. prostrata* (*L. hirta* Spr. var. *prostrata* Hook. f.).—*Christine Fredrika Posse.*

8066. Haines, H. H. **The botany of Bihar and Orissa. An account of all the known indigenous plants of the Province and of the most important or most commonly cultivated exotic ones. Part V. Apetalae.** *Small 8vo, 755–1058 p.* Adlard & Son and West Newman: London, 1924.—This follows strictly the plan of previously issued parts of the work and includes the families Nyctaginaceae to the genus *Ophiurus* (in part) of the Gramineae. The following apparently new names and combinations are included: *Celosia argentea* L. var. *cristata* (*C. cristata* L.); *Amarantus caudatus* L. var. *alopecurus; A. gangeticus* L. vars. *tristis* (*A. tristis* L.), *lividus* (*A. lividus* Roxb.), *oleraceus* (*A. oleraceus* Roxb., not L.), *tricolor* (*A. tricolor* Willd.), *melancholicus* (*A. melancholichus* Willd.), and *polygamus* (*A. polygamus* Roxb., not L.); *Litsea sebifera* Pers. var. *normalis; Beilschmiedia Roxburghiana* Nees vars. *fagifolia* (*B. fagifolia* Nees) and *Dalzellii* Meissn. (*B. Dalzellii* Meissn.); *Heloptelea integrifolia* Planch. vars. *tomentosa* and *fruticosa; Trema amboinensis* (*T. amboinensis* Blume); *Lagarosiphon alternifolia* (*Vallisneria alternifolia* Roxb.); *Theriophonum minutum* Engl. var. *Chattarjeei; Colocasia antiquorum* Schott vars. *typica, stolonifera* and *rupicola; Cyperus nutans* Vahl var. *eleusinoides* (*C. eleusinoides* Kunth); *Pycreus pumilus* (*Cyperus pumilus* L.); *P. globosus* (*C. globosus* All.); *Mariscus compactus* (*Cyperus compactus* Retz); *Dendrocalamus strictus* Nees var. *sericeus* (*D. sericeus* Munro); *Bambusa arundinacea* Willd. vars. *spinosa* and *orientalis; Cynodon dactylon* Pers. var. *suberectum; Setaria glauca* Beauv. var. *parviflora* Munro; *Sacciolepis indica* (*Panicum indicum* L.); *S. myosuroides* (*P. myosuroides* Br.); *Brachiaria distachyum* (*P. distachyum* L.); *B. ramosa* (*P. ramosum* L.); *B. Kurzii; B. remota* (*P. remotum* Retz); *Digitaria sanguinalis* Scop. forma *purpurea; Eulalia Cumingii* (*Pollinia Cumingii* Nees); **Pollinidium** Stapf n. gen., *P. angustifolium* (*Ischaemum angustifolium* Hack.); *Capillipedium assimilis* (*Andropogon assimilis* Steud.); *Amphilophis pertusa* (*Andropogon pertusus* Willd.); *A. Kuntzeana* (*A. Kuntzeanus* Hack.); *Sorghum fascicularis* (*A. fascicularis* Roxb.); *Chrysopogon lancearius* (*A. lancearius* Hook. f.); *C. Hamiltonii* (*A. Hamiltonii* Hook. f.); *Dichanthium caricosum* (*A. caricosus* L.); *D. Clarkei* (*A. Clarkei* Hack.); *Hypogynium foveolatum* (*A. foveolatus* Del.); *Cymbopogon gidarba* (*A. Gidarba* Ham.); *Themeda strigosa* (*Anthistiria strigosa* Ham.); *Iseilema laxum* Hack. f. *ciliatum; I. Holei;* and *Apluda varia.* Hack. subsp. *mutica.* —*J. M. Greenman.*

8067. Ridley, Henry N. **The flora of the Malay Peninsula. Vol. III. Apetalae.** *8vo, 405 p. Fig. 132–159.* L. Reeve & Co., Ltd.: London, 1924.—The present volume follows the plan of the previous volumes of this work and includes the families Nyctaginaceae to Salicaceae. New species, varieties, and combinations herein published are the following: *Allmania nodiflora* Br. vars. *esculenta* and *procumbens, Cyathula prostrata* Bl. var. *major, Polygonum barbatum* L. vars. *typicum* and *glabratum, Nepenthes gracillima* Ridl. var. *major, N. alba* (*N. singalana* Macfarlane, not Becc) *N. gracilis* Korth. var. *arenaria, Piper pentandrum* C. DC.

var. *magnifolium*, *P. subpenninerve* (*P. nigrum* var. *subpenninerve* C. DC.), *Beilschmiedia brevipes*, *Cinnamomum microphyllum* (*C. parvifolium* Ridl., not Lecomte), *C. iners* Bl. var. *angustifolium*, *C. Scortechinii* Gamble var. *selangorense*, *C. puberulum*, *Phoebe tavoyana* Hook. f. var. *villosa*, *Actinodaphne pruinosa* Nees var. *Kunstleri*, *A. oleifolia* Gamble var. *glabra*, *A. gelonioides*, *Litsea magnifica* Gamble var. *pahangensis*, *L. machilifolia* Gamble var. *montana*, *L. lancifolia* Hook. f. var. *rufa*, *Helicia excelsa* Bl. vars. *salicifolia* and *Forbesii*, *Aquilaria rostrata*, *Loranthus pulcher* DC. var. *sessiliflora*, *Elytranthe rubra*, *E. globosa* Don var. *puberula*, *Henslowia minor* (*H. Ridleyi* Ridl., not Gamble), *Phacellaria malayana*, *Cleistanthus nitidus* Hook. f. var. *Curtisii* (*C. Curtisii* Jabl.), *C. gracilis* Hook. f. var. *parvifolia*, *C. perakensis* Gage (*C. vestitus* var. *perakensis* Jabl.), *Phyllanthus frondosus* Wall. var. *rigidus*, *Glochidion laevigatum* Hook. f. var. *cuspidatum*, *Emblica pectinata* (*Phyllanthus pectinatus* Hook. f.), *Antidesma salicinum* (*A. salicifolium* Hook. f., not Miq.), *A. salicinum* var. *latior*, *A. montanum* Bl. vars. *oblanceolata* and *rigida*, *A. cuspidatum* Müll. Arg. var. *leiodiscus*, *Aporosa Maingayi* Hook. f. var. *penangensis*, *Baccaurea reticulata* Hook. f. var. *velutina*, *Galearia fusca*, *Kunstlerodendron cuspidata*, *Mallotus penangensis* Müll. Arg. var. *grandifolia*, *Coccoceras muticum* Müll. Arg. var. *pedicellatum*, *Ptychopyxis Kingii*, *P. angustifolia* Gage, *Ficus Burkillii*, *F. microsyce*, *F. quercifolia* Roxb. var. *inconstans* (*F. inconstans* Miq.), *F. diversifolia* Bl. vars. *ovoidea* (*F. ovoidea* Jack.), *deltoidea* (*F. deltoidea* Jack.) and *lutescens*, *F. mollissima*, *F. pyriformis* H. & A. var. *angustifolia*, *Pellionia Duvauana* N. E. Br. vars. *viridis* and *pulcherrima*, *Pouzolzia viminea* Wedd. var. *punctata*, *P. indica* Gaud. vars. *angustifolia*, *microphylla* and *alienata*, *Myrica auriculata* (*M. aesculenta* var. *auriculata* Gamble), *Pasania spicata* Oerst. var. *microcalyx*, and *P. rassa* Gamble var. *suffruticosa*.—*J. M. Greenman.*

8068. Vuillemin, Paul. **Classification des Monocotylédones.** Compt. Rend. Acad. Sci. Paris 176: 23–26. 1923.—This study is based largely upon the morphology of the flower. As in the Dicotyledons the different degrees of evolution of the flower are found, namely: amphigonelle, acrogonelle, and anthogonelle (true flower). The cyclic arrangement of parts is not apparent in the amphigonelle, but the insertion of parts is as in the phyllotaxis of the vegetative portion of the plant. In the anthogones there is attained the tricyclic formula: S. PE. C. which corresponds to the tetracyclic formula: S. P. E. C. of the Dicotyledons. The following classification is given:

Monocotylédones

Amphigones		Acrogones			Anthogones	
Orders	Families	Orders	Families	*Tribes*	Families and *Tribes*	
II. Spadicinées						
	Lemnacées					
	Typhacées					
	Aracées					
	Pandanacées					
		IV. Palmiers				
		VI. Smilacinées	Smilacacées	*Astéliées*		
				Dioscorées	Bromeliacées	Marantacées
						Zingibéracées
						Musacées
					Hémodoracées	Iridacées
						Amaryllidacées
				Smilacées		
				Dracaenées	*Asparagées*	*Convallariées*
				Paridées		
				Vératrées	Colchicacées	*Colchicées*
		V. Joncinées	(Colchicacées)			
			Joncacées		Liliacées	*Liliées*
						Philydrées
			Cypéracées			
			Graminées			

III. Enantioblastées
- Centrolépidacées
- Restiacées
  - *Maïacées*
  - *Flagellariées*
  - *Restiées*
  - *Eriocaulées*
- Xyridacées
- Commelinacées

I. Hélobiées
- Naïadacées
- Alismacées
  - *Triglochinées*
  - *Alismées*
  - *Butomées*
- Hydrocharidacées
- Burmanniacées
- Orchidacées
  - *Apostasiées*
  - *Orchidées*

Orders are given in bold type, tribes in italics, and families in ordinary type.—*C. H. Farr.*

PTERIDOPHYTES

8069. Dunn, S. T. **The ferns of Bombay.** [Rev. of: Blatter, E., and J. F. d'Almeida. **The ferns of Bombay.** *viii + 228 p., 17 pl. (2 col.), 43 fig.* Taraporevala Sons & Co.: Bombay, 1922 (see Bot. Absts. 12, Entry 4636).] Kew Bull. 1922: 350. 1922.—This is a pocket guide to the wild and cultivated ferns, with a synopsis of 54 genera. [See also Bot. Absts. 12, Entries 4637, 6661.]—*T. J. Fitzpatrick.*

SPERMATOPHYTES

8070. Anonymous. **Novitates Africanae.** Ann. Bolus Herb. **3**: 123–146. 1922.—The following new species of South African plants are described by L. Bolus: *Mesembrianthemum ausense, M. Vermeuleniae, M. Beswickii, M. velutinum, M. Frithii, M. Englishiae, M. Wordsworthiae, M. Vanzijliae, M. brakdamense, M. amicorum, M. carolinense, M. ventricosum, M. Caroli, M. Mallesoniae, M. Muelleri, M. bifoliatum, M. Peersii, M. Kolbei, M. Britteniae, M. sociorum, M. cinctum, M. excavatum, M. integrum, M. dependens, M. uniflorum, M. induratum, M. viatorum, M. solidum, M. Juritzii, M. Mellei,* and *M. Muirii.* The following new species are also described: *Aristea ensifolia* Muir, *Watsonia Versfeldii* Mathews & L. Bolus, *W. bulbillifera* Mathews & L. Bolus, *W. tabularis* Mathews & L. Bolus, *Gladiolus Mostertiae* L. Bolus, *Restio paludosus* Pillans, *Dovea Marlothii* Pillans, *D. chartacea* Pillans, *Elegia lacerata* Pillans, *E. pectinata* Pillans. The following new combinations have been made: *Restio tuberculata* Pillans (*Leptocarpus divaricatus* Mast.), *Dovea nuda* Pillans (*Elegia nuda* Kunth), *Elegia thyrsoidea* Pillans (*Dovea thyrsoidea* Mast.), and *Leptocarpus gracilis* Pillans (*Hypolaena gracilis* Mast.).—*L. J. Goldblatt.*

8071. Brown, N. E. **The genera Aloe and Mesembryanthemum as represented in Thunberg's herbarium.** Bothalia **1**: 139–169. 1922.—Through the courtesy of the Director of the Upsala Botanic Garden, an opportunity was afforded to examine the type specimens of the genera *Aloe* and *Mesembryanthemum* collected in South Africa by Thunberg, and to compare them with the material at Kew. The species are arranged alphabetically. Critical notes are given on 15 species of *Aloe* and on 27 species of *Mesembryanthemum.*—*E. M. Doidge.*

8072. Cheeseman, T. F. **New species of flowering plants.** Trans. and Proc. New Zealand Inst. **54**: 565–569. 1923.—*Astelia Cockyanei, Nasturtium Gibbsii, Pomaderris rugosa, Nothopanax laetum,* and *Aciphylla divisa* are described as new species and their relationships indicated. Notes are given regarding *Epilobium junceum* Soland.—*Wm. Randolph Taylor.*

8073. Klett, Wolfgang. **Pseudospigelia, eine neue Gattung der Loganiaceae. [Pseudospigelia, a new genus of the Loganiaceae.]** Bot. Archiv. **3**: 134–136. 1923.—**Pseudospigelia** is described as a new genus. Only one species, *P. polystachya* (*Spigelia polystachya* Klotszch) from British Guiana, Nicaragua, and Brazil, is known. The type specimen is at the Berlin Botanical Museum.—*William Seifriz.*

8074. Kozo[t]-Poljanski, B. [M.] **Species novae III.** [New species III.] Notulae Systematicae Herb. Hort. Bot. Petropolitani 2: 61–68. 1921.—The author describes several new species of Umbelliferae, namely: *Ferula Aitchisonii* (related to *F. Schair* Borscz.), *F. badra-kema* (related to *F. galbaniflua* Boiss. & Buhse), *F. clematidifolia* (related to *F. penninervis* Rgl. & Schmlh.), *F. equisetacea* (related to *F. stenocarpa* Boiss & Hausskn.), *F. Fedtschenkoana* (related to *F. dissecta* Ledb.), and *Dorema hyrcanum* (related to *D. resinosum* (Siev.) Kozo-Pol. All are from Turkestan.—*Author*,

8075. Kozo[t]-Poljanski, B. [M.] **Species novae. IV.** Notulae Systematicae Herb. Hort. Bot. Petropolitani 2: 141–144. 1921.—The author describes a new species of *Daphne, D. Julia*, from the Province of Woronesh, South-European Russia, closely related to *D. Cneorum* L. This species grows in an unusual plant association, side by side with *Bupleurum ranunculoides* L., *Gypsophila Litwinowi* K.-Pol., *Betula humilis* Schrank var. *cretacea* Litw., *Onosma simplicissimum* L., *Polygala hybrida* DC., *Euphorbia sareptana* Becker, etc. The author supposes that *D. Julia, B. ranuncoloides, G. Litwinowi, B. humilis*, etc. are, in this country, relicts from the glacial period.—*Author*.

8076. Kozo[t]-Poljanski, B. [M.] **Species novae. V.** Notulae Systematicae Herb. Hort. Bot. Petropolitani 3: 69–72. 1922.—Two new species are described, namely, *Carum Aphanoplerae* from Buchara and *Ferula Syreitschikowi* from the Province of Semiretschensk (Hptapotamaea), Russia.—*J. M. Greenman.*

8077. Kozo[t]-Poljanski, B. [M.] **Species novae. VI.** Notulae Systematicae Herb. Hort. Bot. Petropolitani 3:171–172. (Reprint p. 1–2.) 1922.—*Ferula Kelleri* is described as a new species from the Province of Semiretschensk (Heptapotamaea), Russia.—*J. M. Greenman.*

8078. Lüdi, W. **Forma stolonifera von Epilobium montanum.** [Abstract.] Mitteil. Naturf. Ges. Bern. 1920: 6–7. 1920.—*Epilobium montanum* var. *Thellungianum* Lév. f. *stoloniferum* is described as a new form from Switzerland.—*J. M. Greenman.*

8079. Merrill, E. D. **Camphorina vs. Cinnamomum.** Bot. Gaz. 70: 84–86. 1920.—Farwell has adopted the generic name *Camphorina* Noronha (1790) in place of *Cinnamomum* Blume (1825), the latter name originally proposed by Tournefort, and used by Linnaeus in the 1st ed. of his Systema Naturae (1735), but later discarded. In his article Farwell proposes the nomen nudum *Camphorina saigonica* for the plant producing the Saigon cinnamon "which has not as yet been definitely determined, but is generally supposed to be an undescribed species." Saigon is merely the place of export of the product, which according to Dr. Chevalier is produced in Annam from *Cinnamomum Loueiri* Nees. Exception is also taken to certain new binomials proposed by Farwell in *Piper* and *Methysticum.*—*Author.*

8080. Miyoshi, Manabu. [**Description and illustration of Iris.**] *1+1+40 p., 4 pl.; and portfolio of 105 col. pl.* 1921.—This work concerns primarily *Iris laevigata* Fisch. and 100 horticultural forms of this species. The scientific names are in Latin; the descriptive matter is in Japanese.—*J. M. Greenman.*

8081. Moore, S. LeM. **A contribution to the flora of Australia.** Jour. Linn. Soc. London 45: 159–220. *Pl. 11–12.* 1920.—Part I concerns 2 species of *Tribulus* described by Robert Brown. The identity of Brown's *Tribulus Hystrix* and *T. occidentalis* is discussed and established. A key to Australian species of *Tribulus* is inserted.—Part II. describes some new or rare West Australian plants from the recent collections of F. Stoward and J. E. C. Maryon. The following new species, varieties and new combination are presented: *Hibbertia pullulla, H. Stowardii, Candollea rupicola, Calandrinia Maryonii, Commersonia Stowardii, Boronia foliosa, Phebalium capitatum, P. deserti* (*Eriostemon deserti* E. Pritz.), *Eriostemon Stowardii, E. thryptomenoides, Oxylobium emarginatum* and var. *major, Burtonia asperula, Daviesia phyllodinea* and var. *parvifolia, D. parvifolia, D. juncea* Sm. var. *spinescens, Gastrolobium Stowardii G. spinosum* Benth. var. *microphyllum, G. sagittulatum, G. floribundum, Cassia Stowardii, Acacia periculosa, A. assimilis, A. intricata, A. saxatilis, A. Stowardii, A. dentifera* Benth. vars. *intermedia* and *parvifolia, A. grisea, Calythrix Stowardii, Baeckea carnosa, B. clavifolia, B. Stowardii, B. exserta, B. tenuiramea, B. thymoides, B. imbricata, Melaleuca concava, Siebera oblonga, Olearia propinqua, Helipterum venustum, H. mullinense, H. intermedium, H. Maryonii, Calocephalus Stowardii, Stylidium nungarinense, S. glanduliferum, Symphyobasis alsinoides, Calogyne linearis, Dampiera rupicola, D. Stowardii, Styphelia tenuiflora* Lindl. var.

breviflora, Eremophila maculata F. Muell. var. *linearifolia, E. Drummondii* F. Muell var. *brevis, Leucopogon pubescens, Hemigenia viscida, Kochia Stowardii, Anisacantha hispida, Gyrostemon Brownii, Grevillea lycopodina, G. integrifolia* Meisn. var. *grandiflora, G. flabellifolia, Monotacis Stowardii, Casuarina Stowardii,* and *C. leptotrema.* Part III describes some new or rare Australian species of older collections. Notes on "plants communicated by travellers at various times during the last century" include a list of such names as R. Brown, A. Cunningham, C. Fraser, and F. W. L. Leichardt with brief notices of their activities. The following new species are described: *Distichostemon filamentosus, Euroschinus parvifolius, Calythrix Wickhamiana, C. Mitchellii, C. interstans, Micromyrtus peltigera, Leptospermum Maxwellii, L. fastigiatum* **Leptospermopsis** n. gen. (Myrtaceae), *L. myrtifolia, Kunzea affinis, K. spicata, Melaleuca Websteri, M. graminea, M. arenicola, Calothamnus validus, Eugenia essingtoniana, Trianthema Maidenii, Mitrasacme latiflora, M. nummularia, Dicrastyles Thomasiae, Grevillea eyreana, G. rubicunda, G. Leichardtii, Dryandra Gilbertii, Euphorbia Bouleyi, Phyllanthus Brunonis, P. Podenzanae, P. arnhemicus, P. lissocarpus, P. eutaxioides, P. pusillifolius, P. eboracensis, P. Leai, Tritaxis australiensis, Croton Armstrongii,* and *Codiaeum membranaceum.—A. J. Eames.*

8082. Petrie, D. **Descriptions of new native flowering plants.** Trans. and Proc. New Zealand Inst. **54**: 569–572. 1923.—*Colobanthus Wallii, Epilobium Wilsoni, Carex Enysii, C. Carsei, Danthonia Raoulii* Hook. f. var. *teretifolia,* and *Poa Wallii* are described as new.—*Wm. Randolph Taylor.*

8083. Phillips, E. P. **Species of Elephantorrhiza in the South African Herbaria.** Bothalia **1**: 187–191. *Pl. 6.* 1922.—Seven species are recognised, including *Elephantorrhiza pubescens* n. sp.—*E. M. Doidge.*

8084. Pires de Lima, Américo. **Subsídios para o estudo da flora de Mocambique. Espermáfitas do litoral norte. 2ª Série. [Foundations for the study of the Mozambique flora. Spermatophytes of the northern coast. 2nd series.]** Bol. Soc. Broteriana II, **2**: (1–29.) 1924. —This article is in continuation of a previous publication (see Bot. Absts. 11, Entry 1988) briefly outlining the characteristics of the region. The present contribution embraces 19 families (Alismaceae—Rubiaceae) with 50 species. Each species is described with precise indication of locality and collection number. The new species, varieties and combinations are: *Fimbristylis elongata* and the var. *longifoliata, F. longibracteata, F. rhizomatosa, Cracca bracteolata* O. K. var. *microfoliata,* and *Hygrophila palmensis. Dichopetalum mocambicensis* (*Chailletia mossambicensis* Klotzsch) and *Oldenlandia prostrata* (*O. decumbens* Hiern) are new combinations. The authority in all cases is Pires de Lima.—*E. B. Chamberlain.*

8085. Preobrashensky, G. **Generis Silene L. species novae Turkestanicae. [New Turkestan species of the genus Silene L.]** Notulae Systematicae Herb. Hort. Bot. Petropolitani **2**: 29–31. 1921.—The new species described are: *Silene ferganica,* closely allied to *S. noctiflora* L., from Fergana, district of Andischan; and *S. Fedtschenkocna* from western Tjan-Schan and Fergana. Both species belong to the section *Melandriformes* Boiss.—*V. Lashevsky.*

8086. Stent, Sydney M. **South African Gramineae. A new genus and seven new species.** Bothalia **1**: 170–178. *Pl. 1–4.* 1922.—The new genus **Mosdenia** is closely related to *Tragus*—"*Tragus* similis sed glumae emuricatae, subaequales, spiculae solitariae. Folia eciliata." The new species described are: *Mosdenia waterbergensis, Eragrostis valida, Schizachyrium inclusum, Enneapogon pretoriensis, Eragrostis Burtt-Davii, E. Galpinii,* and *Tristachya pedicellata.—E. M. Doidge.*

8087. Urban, Ignatius. **Flora domingensis. [Flora of Santo Domingo.]** Symbolae Antillanae **8**: 1–480. Feb. 1, 1920; 481–860. June 1, 1921.—This flora records the species and varieties of gymnosperms and angiosperms known at the present time to occur in Santo Domingo. There are no keys to the families, genera, and species, and only the new species and varieties are described. The essential bibliography and synonymy are given; important exsiccatae are cited; and the general geographical distribution of species is indicated. New species, varieties, and combinations included are: *Digitaria panicea* (*Milium paniceum* Sw.), *D. leucocoma* (*Syntherisma leucocomum* Nash, *Panicum leucocomum* Scribn.), *S. digitata* (*Milium digitatum* Sw.), *Setaria geniculata* (Lam.) Beauv. var. *purpurascens* (*S. purpurascens* HBK.), *Zeugites haitiensis*

(*Z. americana* subsp. *haitiensis* Pilger), *Martinezia acanthophylla* Becc. (*Bactris acanthophylla* Mart.), *Dichaeopsis Morrisii* Schlechter (*Dichaea Morrisii* Fawc. & Rendle), *Ampalis mauritiana* (*Morus mauritiana* Jacq.), *Ficus populnea* Willd. var. *Hispaniolae* (*F. populnea* var. *laevigata* subvar. *Hispaniolae* Warb.), *Pilea microphylla* (L.) Liebm. var. *tenerrima* (*P. tenerrima* Miq.), *Phthirusa pycnophylla* (*Dendropemon pycnophyllus* Krug & Urban), *P. subsessilis* (*D. subsessilis* Urb.), *P. emarginata* (Sw.) Eichl. var. *brachycarpa* (*D. emarginatus* var. *brachycarpus* Krug & Urban), *P. rostrata* (*D. rostratus* Urb.), *P. oligantha* (*D. oliganthus* Urb.), *Phoradendron ovatifolium* (*P. dichotomum* var. *ovatifolium* Krug & Urban), *Atriplex crispa* (*Obione crispa* Moq.), *Brassica campestris* L. f. *auriculata* O. E. Schulz (*Sinapis auriculata* P. DC.). *Cassia Tuerckheimii* (*Chamaecrista Tuerckheimii* Britt.), *Desmodium intortum* (*Hedysarum intortum* Mill.), *Erythrina Plumerii* (*E. inermis* Aubl., not Mill.), *Fagara Nashii* (*Zanthoxylum Nashii* P. Wils.), *Bursera Nashii* (*Terebinthus Nashii* Britt.), *Cephalocereus Schlumbergeri* (*Pilocereus Schlumbergeri* Weber), *Eugenia pomifera* (Aubl.) Urb. var. *angustissima* (*E. angustifolia* var. *angustissima* Krug & Urban), *E. pomifera* var. *latifolia* (*E. rosmarinifolia* var. *latifolia* Berg.), *Miconia Desportesii*, *Lyonia haitiensis*, *L. Tippenhaueri*, *L. Buchii*, *Buddleja calcicola*, *Sabbatia cubensis* (*S. gracilis* Salisb. var. *cubensis* Griseb.), *Metastelma astephanoides* Schltr., *Cordia Fitchii*, *Tournefortia Picardae*, *Solanum fugax* Jacq. vars. *flexuosum* (*S. flexuosum* Willd.) and *albidiochraceum* (*Lycianthes fugax* var. *albidochraceum* Bitter), *Tabebuia Grisebachii* (*T. longiflora* Griseb., not Bur. & K. Schum.), *Besleria lutea* L. var. *leucantha*, *Ruellia lepidota*, *Exostema caribaeum* (Jacq.) R. & S. var. *velutinum*, *E. subcordatum* Krug & Urban var. *Buchii*, *Chiococca alba* (L.) Hitchcock var. *parvifolia* (*C. parvifolia* Wullschläg.), *Chione exserta* (*P. DC.*) Urb. (*Psychotria coriacea* Spreng.), *Psychotria undata* Jacq. var. *Poitaei*, *P. tetrapyrena* (*P. pendula* subsp. *tetrapyrena* Urb., *Diodia rigida* Cham. & Schlecht. var. *Buchii*, *Eupatorium sinuatum* Lam. var. *Desportesii*, *Chaptalia dentata* (L.) Cass. var. *leiocarpa* (*Leria leiocarpa* P. DC.), *Lasiacis maculata* (*Panicum maculatum* Aubl.), and *Alternanthera Urbani* (*Achyranthes Urbani* Standl.).—*J. M. Greenman.*

REVISIONS AND MONOGRAPHS

8088. Baker, Edmund G. **Revision of South African Species of Rhynchosia.** Bothalia 1: 113–138. 1922.—Since the publication of the *Leguminosae* by Harvey in the Flora Capensis (1861–1862), a considerable amount of additional information has been acquired and this is now put on record. Fifty-eight species of *Rhynchosia* are described, including the following new species: *R. Dieterlenae*, *R. Stenodon*, *R. Galpini*, *R. Pegleri*, *R. Schlechteri* and 3 new varieties.—*E. M. Doidge.*

8089. Buscalioni, Luigi, e Giuseppe Muscatello. **Studio monografico sulle Specie americane del Gen. "Saurauia" Willd.** (continuazione). [**Monograph of American species of Saurauia Willd. (continued).**] Malpighia 29: 411–458. 1923.—The species discussed in this number include: *Saurauia Maxoni* D. Sm., *S. Zahlbruckneri* Busc. n. sp., *S. Smithiana* Busc. n. sp., and *S. aequatoriensis* Sprague.—*Edith K. Cash.*

8090. Poisson, Henri. **Nouvelle Contribution à l'étude des Pachypodium malgaches. [Recent contribution to the study of Pachypodium of the Malagasy region.]** Bull. Acad. Malgache. N. S. 6: 1–10. *10 pl.* 1922–1923.—The author, who has studied the genus *Pachypodium* in its native habitat, Madagascar, subdivides it into 3 groups, namely, white, yellow, and red flowered. In the 1st group are put the arborescent species, *P. Rutenbergianum* (including *P. Lameri*), with exserted stamens, and *P. Geayi*, with included stamens; and the shrubby species *P. ambogense*, slightly spiny and with a large corolla-tube, and *P. Decaryi*, very spiny and with a narrow corolla-tube. In the 2nd group are placed *P. densiflorum*, with exserted stamens, and *P. brevicaule*, *P. Drakei*, *P. rosulatum* and *P. Horombense*, with included stamens. The flowers of *P. brevicaule* are small, 2 cm. or less long; those of the 3 other species are 2–5 cm. long. The species of the 3rd group are all shrubby and include *P. Windorsi*, an almost naked plant with bright green leaves, not acuminate, and with no floral peduncle; and *P. Baroni* (with its variety *erythreum*) with acuminate, dark green leaves and with a floral peduncle of at least 12–15 cm. in length. All these are xerophytes, and certain species, such as *P. Rutenbergianum*, yield fibers which are utilized by the Sakalaves for the production of ropes.—*H. Jumelle.*

FLORISTICS AND PLANT DISTRIBUTION

8091. Anonymous. [Additions and alterations to the] Census of Victorian plants. Victorian Nat. 40: 147. 1923.—Additions recorded are *Bassia tricornis* F.v.M., *Minuria denticulata* Benth., and *Centipeda thespidioides* F.v.M., all from Mildura, N. W.—*Wm. Randolph Taylor.*

8092. Bean, Ralph C. **Some heaths of Hancock County.** Maine Nat. 4: 8–11. 1924.—This gives a description of certain raised bogs in Maine.—*C. A. Weatherby.*

8093. Bolus, L. **South African Iridaceae.** Jour. Bot. Soc. South Africa 9: 15–18. *Pl. 3.* 1923.—A general description of the genus is given with a key to the identification of the South African species in the field. There are some 800 species in the family, contained in about 58 genera distributed throughout the tropical and temperate regions, but massed chiefly in Tropical America and South Africa, where about ½ the known species and more than ½ the known genera are to be found.—*L. I. Goldblatt.*

8094. Burkill, I. H. **A list of Oriental vernacular names of the genus Dioscorea.** Gardens' Bull. Straits Settlements 3: 121–244. *Maps 1–11.* 1924.—The 2nd part of this paper consists of a list of about 2000 names for cultivated and wild species and races of *Dioscorea* in the East. The 1st part is a discussion of the distribution of the names, illustrated by maps, and of the origin and adoption of the cultivated edible races of *D. alata, D. opposita, D. esculenta, D. bulbifera* and *D. pentaphylla.*—*R. E. Holttum.*

8095. Coburn, Louise H. **Rhododendron canadense [in Maine].** Maine Nat. 4: 11–12. *1 pl.* 1924.

8096. Coleman, E. **An orchid note.** Victorian Nat. 40: 169. 1923.—Record is made of a *Calochilus* in which the labellum is not fringed or bearded as in other members of this genus.—*Wm. Randolph Taylor.*

8097. Coleman, E. **Excursion to Cheltenham.** Victorian Nat. 40: 125. 1923.—Orchids collected are mentioned.—*Wm. Randolph Taylor.*

8098. Danser, B. H. **De nederlandsche Rumexbastaarden.** [Dutch Rumex hybrids.] Nederland Kruidk. Arch. 1921: 229–265. *2 pl.* 1922.—Various *Rumex* hybrids are described as occurring in different parts of the Netherlands and questions of nomenclature are discussed. *Rumex conspersus* Hartman (*aquaticus* × *crispus*) is spread over a limited area only, namely, the banks of the Rhine and its tributaries. *Rumex maximus* Schreb. (*aquaticus* × *Hydrolapathum*) occurs quite commonly and has been collected by several investigators. The same is true of *Rumex platyphyllus* Aresch. (*aquaticus* × *obtusifolius*). Other hybrid forms discussed are *Rumex Ruhmeri* Hausskn. (*sanguineus* × *conglomeratus*), *Rumex Sagorskii* Hausskn. (*crispus* × *sanguineus*), *Rumex Schulzei* Hausskn. (*crispus* × *conglomeratus*), *Rumex Weberi* (*Hydrolapathum* × *obtusifolius*), *Rumex Schreberi* Hausskn. (*crispus* × *Hydrolapathum*), *Rumex Wachteri* n. hyb. (obtusifolius × *odontocarpus*), and *Rumex Wettsteinii* Wildt. (*odontocarpus* × obtusifolius).—*A. R. Saunders.*

8099. Hagerup, O. **Om "Lobelia-Diagram" hos Erica cinereae L.** [Lobelia diagram in Erica cinerea L.] Bot. Tidsskr. 38: 137–140. 1923.—*Erica cinerea,* a low heath, is common on the Faroe Islands. Ecologically it resembles *Calluna* rather than *Erica tetralix.* Usually the floral parts are arranged in fours, but sometimes in fives. In this respect, they resemble the Lobelias, a character which at least may indicate the possible union of the *Ericaceae* and *Rhodoraceae.*—*A. L. Bakke.*

8100. Paton, D. J., and C. Daley. **Excursion to Bendigo.** Victorian Nat. 40: 125–127. 1923.—A general discussion of the plants collected, with special attention to the orchids is given, and a list of plants not previously listed on the excursions is appended.—*Wm. Randolph Taylor.*

8101. Pawtowski, Bogumit. **Zapiski florystyczne z Tatr.** [Floristic notices from the Tatra.] Acta Soc. Bot. Poloniae 1: 1–7. 1923.—Important floristic notes are recorded on some 30 species and varieties of flowering plants of the Tatra group of the West Carpathians. *Campanula Kladniana* (Schur.) Wit. subspp. *polymorpha* and *mentiens* Wit. are reduced to varietal rank.—*J. M. Greenman.*

8102. Rholena, J. **Additamenta in floram dalmaticam.** [Additions to the Dalmatian flora.] Preslia 2: 98–102. 1922 [1923].—About 100 species, varieties, forms, etc., of ferns and

flowering plants are recorded as new to the flora of Dalmatia. The list includes 2 new hybrids, namely, × *Orchis Čelakovskyi* (*O. pauciflorus* × *quadripunctatus*) and × *Erigeron Čelakovskyi* (*E. canadensis* × *Conyza ambigua* DC.)—*J. M. Greenman.*

8103. Sainsbury, G. O. K. **Notes on Pittosporum obcordatum.** Trans. and Proc. New Zealand Inst. 54: 572–573. 1923.—This plant has only been found at 3 localities, Akawa (1840 or 1842), near Kaitaia (1901), and Wairoa (1920), all in New Zealand.—*Wm. Randolph Taylor.*

8104. Sampaio, Gonçalo. **Apontamentos sobre a Flora portuguesa. [Remarks on the Portuguese Flora.]** Bol. Soc. Broteriana II, 1: (3–15). 1922.—The article contains notes on 36 species of seed plants. *Juniperus rufescens* Link. is a distinct species, a key indicating its distinguishing characters; *Paspalum dilatatum* Poir. has been introduced from South America; *Trichodium salmanticum* Lag. = *Agrostis salmanticum* Kunth; *Asphodelus Morisianus* Parl. is not a hybrid; *Narcissus scaberulus* Henr. is a good species; *Iris Taiti* Fost. is a synonym of of *I. Fontanesi* Gr. & God.; *Crocus asturicus* Cout. is not found in Portugal; *Sueda vermiculata* Forsk. is new to Europe; *Aristolochia clematitis* L. and *Delphinium hispanicum* Wilk. are not found in Portugal; the Portuguese plants reported as *Fumaria segetalis* Hamm. and *F. Reuteri* Pugs. are *F. Thureti* Bois.; *F. micrantha* Lag. is not synonymous with *F. densiflora* DC.; *Ulex Jussiaei* and *U. opistolepis* of Webb are synonyms of *U. Galli* Planch.; *Ononis Broteriana* DC. and *O. Bourgaei* Bois. & Reut. form a variety (var. *Broteriana* Pau) of *O. subspicata* Lag.; *Astragalus saxatilis* Cav. = *A. monspessulanus* L. var. *chlorocyaneus* Costa; *Lathrus nudicaulis* Samp. is a valid species; *Lathyrus clymenum* L. does not occur in Portugal; *Dianthus Planellae* Willk. is only a form (f. *Planellae* Samp.) of *D. laricifolius* B. & R., while *D. cintranus* B. & R. and *D. Marizi* Samp. are good species; *Saxifraga albarracinensis* Pau has priority over *S. Hervieri* Debx. & Rev., the Portuguese reports of *Carduus medius* Gou, *C. granatensis* Willk., *C. nutans* L., and *C. platypus* Lge. seem based upon either *C. nigrescens* Vill. or *C. Broteroi* Welw.; *Asphodelus ramosus* L. var. *fuscescens* Samp., *Halimium caeiranthoides* Samp. race *lasianthum* Samp., *H. scabrosum* Samp. *Tuberaria lignosa* Samp., and *Linaria Munbyana* B. & R. var. *pygmaea* Samp. appear to be new combinations; the remaining notes refer only to minor additions to the Portuguese flora.—*E. B. Chamberlain.*

8105. Sampaio, Gonçalo. **Observações sobre algumas plantas. [Notes upon various plants.]** An. Acad. Polytechnica Porto 14: (1–23). 1921.—The notes in this paper deal with several distinct matters. Of the 70 plants mentioned, several are recorded as new elements in the Portuguese flora; *Carex algarbiensis* Samp. and *Evax lusitanica* Samp. are proposed as new species; *Nephrodium rupestre* Samp., *Juniperus oxycedrus* Brot., *Chamagrostis littorea* Samp., *Luzula Henriquesii* Degen, *Biscutela montana* P. Cout., *Dorycnium Jordani* L. & Barr., *Ononis antiquorum* L., and *Jasione amethestina* Lag., are reduced to races of other species; *Genista hystrix* Lange, *Nepeta violacea* Brot., and *Galium Broterianum* Boiss. & Reut., are reduced to varieties; *Silene duriensis* Samp. is raised to specific rank; the subgenus *Cota* of *Anthemis*, with 4 species, is transferred to *Anacyclus; Leucanthemum flaveolum* Samp. is reduced to *L. aragonense;* Petiver f. (1764) is proposed for the authority for combinations in *Damasonium*, *Persicaria*, *Barbaraea*, and *Viola*, with a few other similar changes of familiar authorities. There are rather detailed notes on the identity and nomenclature of *Echium Broteri* Samp., *Omphalodes nitida* Hoffm. & Link, and *Brassica nostalgica* Samp. For the last the new combination *B. bursapastorifolia* is proposed.—*E. B. Chamberlain.*

8106. Stephens, Edith. **Carnivorous plants of the Cape Peninsula.** Jour. Bot. Soc. South Africa 9: 21–24. *Pl. 4.* 1923.—A description is given of the plants and mechanisms of sundews (*Drosera*) and bladderworts (*Utricularia*). A key is given to the 7 Cape species of *Drosera* with a note on each. There are 3 Cape species of *Ultricularia*, though possibly the small flowered form *U. Ecklonii* Spreng. may be identical with the large flowered *U. capensis* Spreng., but produced under different conditions of soil and season. An experiment has been initiated to settle this point by planting the forms side by side in a swamp garden under the same conditions.—*L. I. Goldblatt.*

8107. Verdoorn, Inez C. **The flowering parasitic plants found in South Africa.** South African Jour. Nat. Hist. 4: 221–228. 1923.—A key is given to the 17 genera of South African flowering parasites with a short description of each genus. These comprise 150 species and represent the following 9 families: *Balanophoraceae, Convolvulaceae, Lauraceae, Hydnoraceae,*

Loranthaceae, Orobanchaceae, Rafflesiaceae, Santalaceae and *Scrophulariaceae.*—*L. I. Goldblatt.*

8108. Whitten, W. L. **The Rhododendrons of Lexington [Maine].** Maine Nat. 4: 14–15. *2 pl.* 1924.

8109. Willis, Lena. **Kalmia latifolia [in Maine].** Maine Nat. 4: 13. *1 pl.* 1924.

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

Sam F. Trelease, *Editor*

8110. Davis, W. H. **Lactophenol.** Bot. Gaz. 77: 343–344. 1924.—Attention is called to the use of lactophenol with stains (see Strasburger-Koernicke, Botanisches Praktikum, Fünfte Auflage, *p. 767*, 1913) as a combination fixing, staining, and preserving solution.—*B. W. Wells.*

8111. Marshall, M. S. **Report on immersion oil.** Amer. Jour. Public Health 14: 623. 1924.—"It was found that 28 cc. of alpha-brom-naphthalene added to 100 cc. of extra heavy oil gives an immersion oil of thep roper refractive index." The "extra heavy oil" is a product secured from the Standard Oil Co. The oil as modified for use is clear, the color of cedar oil, has about ⅛ the viscosity, and, as evaporation is practically nil, does not undergo change of refractive index from drying, as is the case with cedar oil.—*C. A. Ludwig.*

8112. Pittier, H. **Note on plants collected in Tropical America.** Jour. Washington (D.C.) Acad. Sci. 13: 428–431. 1923.—The author, who has collected approximately 18,000 plants in Central America and the northern part of South America, explains the origin of 2 series of numbers for these plants. The plants in the 1st series were collected by various botanists associated with the Physico-Geographical Institute of Costa Rica, of which the author was director from 1887 to 1903. Since each label on plants distributed bore the name of the collector, these numbers are sometimes confused with those of the personal series later distributed by the author. To avoid this confusion, all numbers in the 1st series when cited should be accompanied by the heading of the label, "Inst. Phys.-geogr. Cost."—*Helen M. Gilkey.*

8113. Smith, Reuben W. **Use of negative prints for comparing microscopic structures.** Bot. Gaz. 77: 230–232. *1 fig.* 1924.—Photomicrographs are made directly on sensitive paper. In the case of wood sections such negatives often clearly differentiate desirable areas, such as fiber regions. The printing paper is supported by a clear glass holder.—*B. W. Wells.*

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